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THE

VOYAGE OF H.M.S. CHALLENGER.

ZOOLOGY—VOL. XXI.

PLATES.

REPORT

ON THE

SCIENTIFIC RESULTS

OF THE

VOYAGE OF H.M.S. CHALLENGER

DURING THE YEARS 1873-76

UNDER THE COMMAND OF

CAPTAIN GEORGE S. NARES, R.N., F.R.S.

AND THE LATE

CAPTAIN FRANK TOURLE THOMSON, R.N.

142616

PREPARED UNDER THE SUPERINTENDENCE OF

THE LATE

Sir C. WYVILLE THOMSON, Knt., F.R.S., &c.

REGIUS PROFESSOR OF NATURAL HISTORY IN THE UNIVERSITY OF EDINBURGH

DIRECTOR OF THE CIVILIAN SCIENTIFIC STAFF ON BOARD

AND NOW OF

JOHN MURRAY

ONE OF THE NATURALISTS OF THE EXPEDITION

ZOOLOGY—VOL. XXI.

PLATES

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By Dr. F. E. Schulze, Professor of Zoology in the University of Berlin.

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EDITORIAL NOTE.

In the following 104 Plates it will be noticed, by reference to the explanations facing them, that in some cases the names have been changed since the Plates were printed off.

John Murray.

Challenger Office, 32 Queen Street,
Edinburgh, 1*st August* 1887.

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PLATE I.

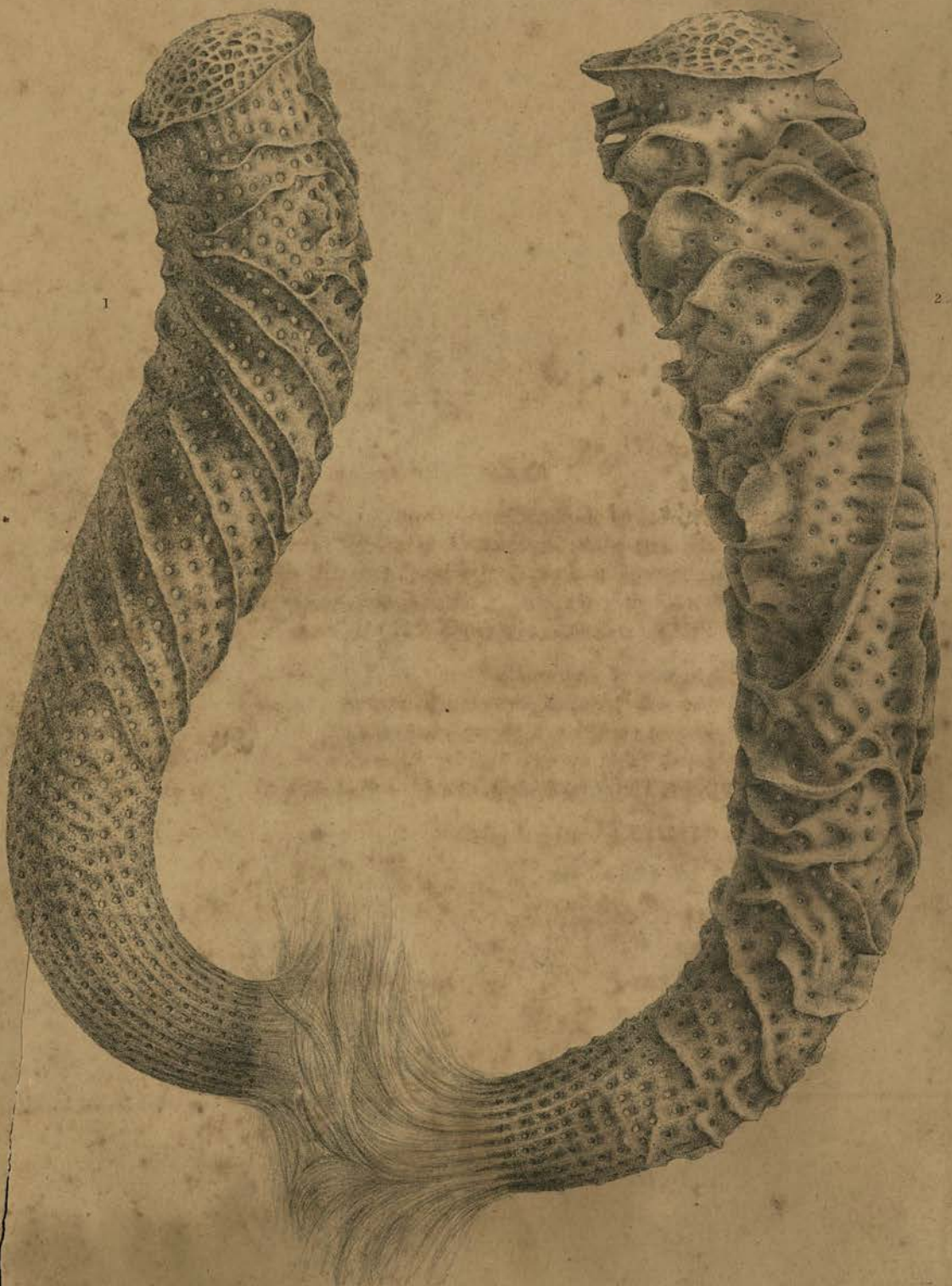
PLATE I.

Eupleciella aspergillum, Owen.

Fig. 1. A specimen of *Eupleciella aspergillum*, Owen, preserved in alcohol, with the soft parts represented in natural size, showing an S-shaped curvature, moderately developed external ridges, and slight ledge surrounding the convex terminal sieve-plate. Obtained near Zebu, Philippine Islands, at a depth of 100 fathoms.

Fig. 2. A specimen of *Eupleciella aspergillum*, Owen, preserved in alcohol, with the soft parts represented in natural size, showing simple hook-shaped curvature, high irregular external ridges, and strongly developed ledge surrounding the terminal sieve-plate. Obtained near Zebu, Philippine Islands, at a depth of 95 fathoms.

The plate was executed under Sir Wyville Thomson's direction.



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EUPLECTELLA ASPERGILLUM OWEN.

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PLATE II.

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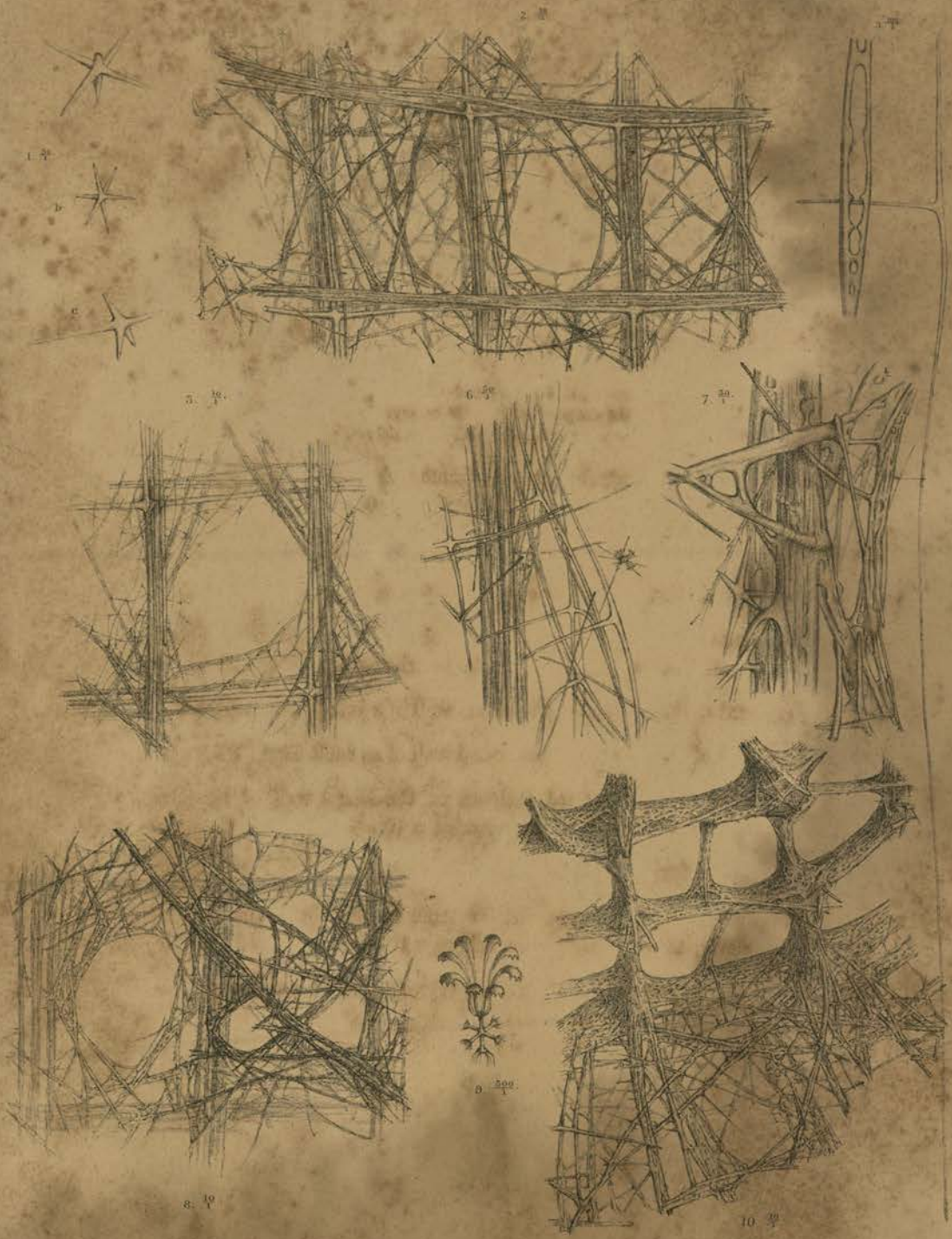
Fig. 9. Portion of a floricome; × 500.

Fig. 10. Fragment of the connected skeleton from the margin of the terminal sieve-plate and surrounding ledge; × 10.

This plate was executed under Sir Wyville Thomson's direction.



Geo. West, Lith. ad nat.

W. & A.K. Johnston, Lithographers

EUPLECTELLA ASPERGILLUM OWEN

PLATE III.

PLATE III.

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Isolated spicules of *Euplectella aspergillum*, Owen, . . . 64

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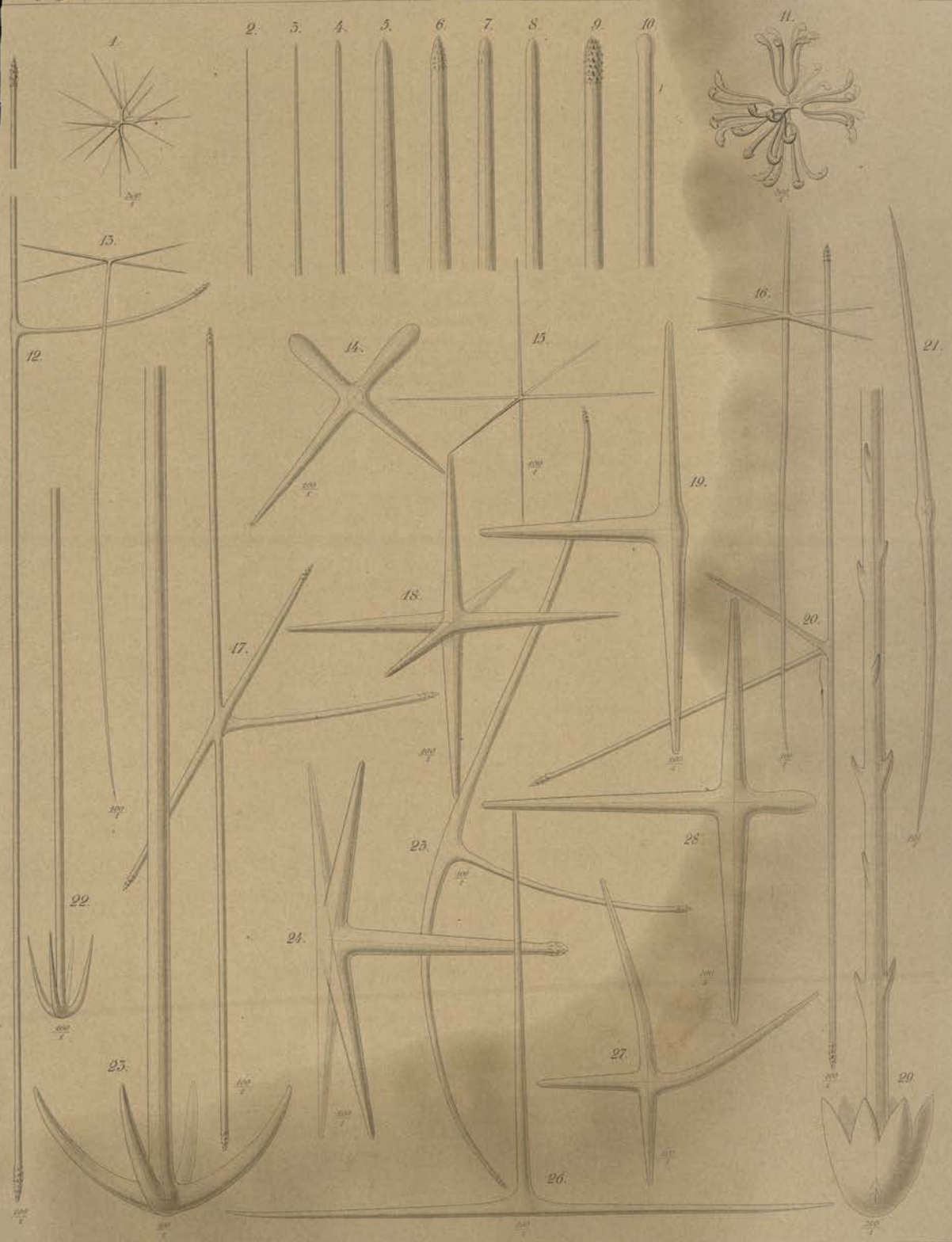

P.E. Schulze and G. Fritsch del.

Lith. Anst. v. Werner & Winter, Frankfurt a/M.

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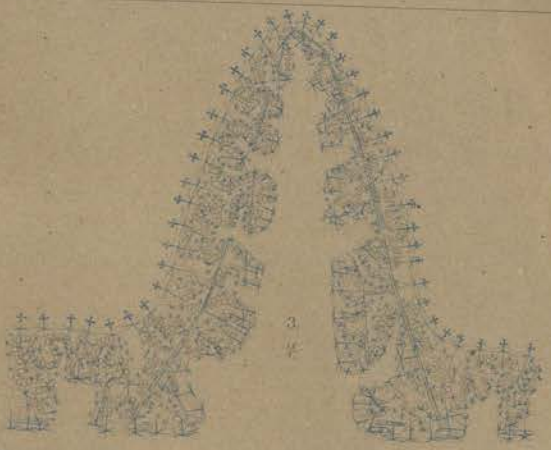

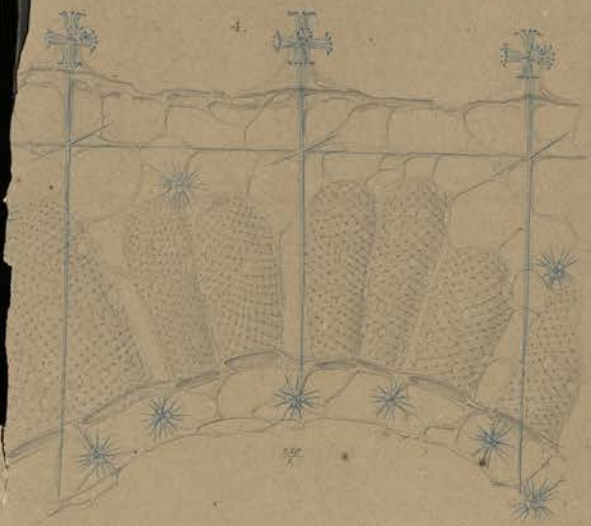

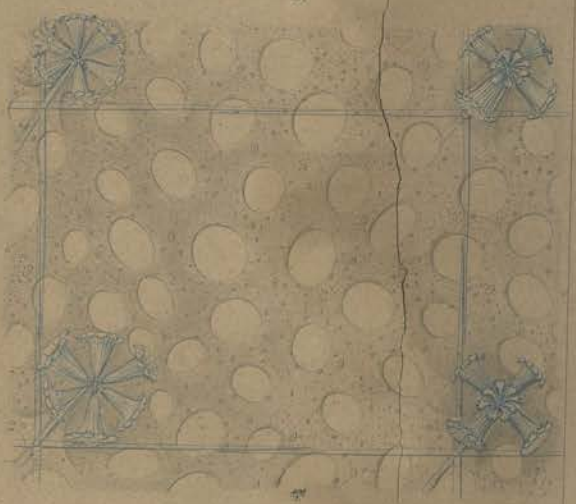

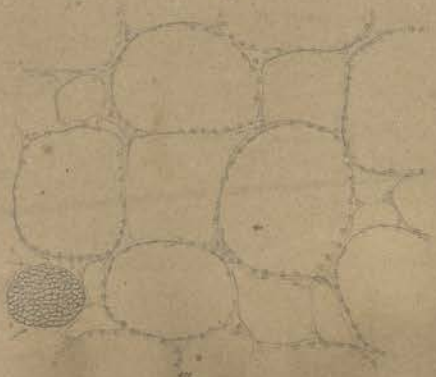

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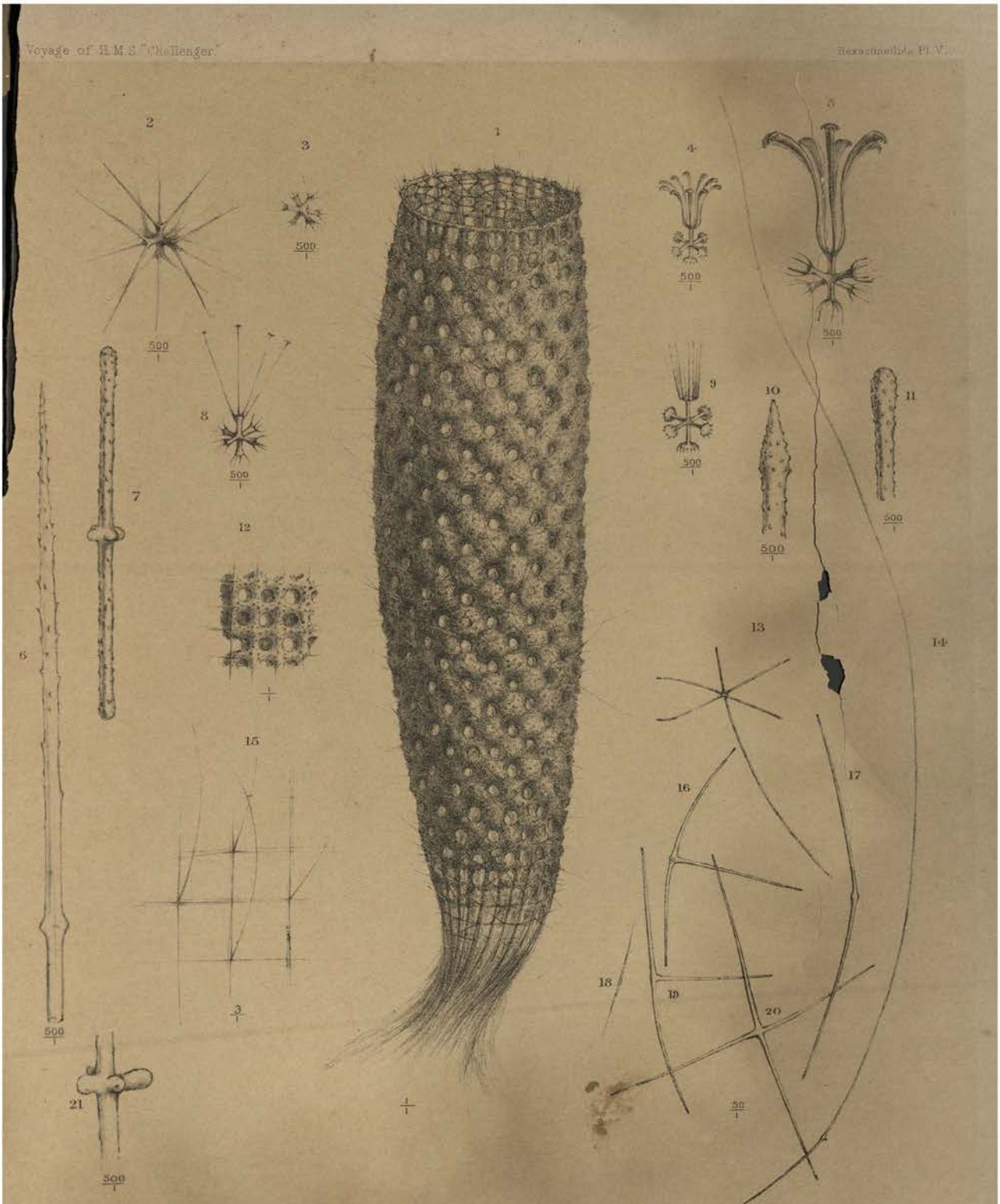
Fig. 21. Fragment of a diact with four projecting central tubercles; × 500.

This plate was executed under Sir Wyville Thomson's direction.



EUPLECTELLA SUBEREA, Wyville Thomson.

West, Lith. ad nat.

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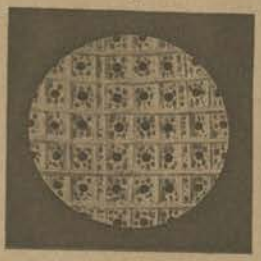

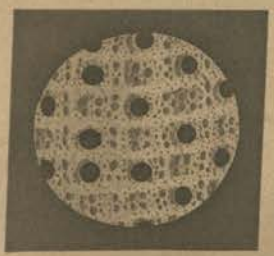

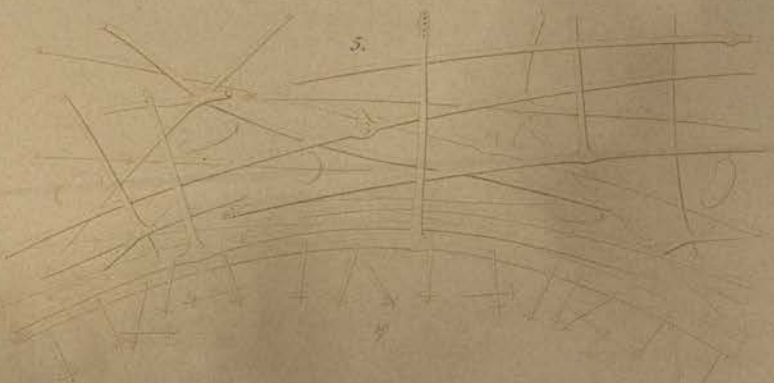

Fig. 1-2. EUPLECTELLA OWENI. Marshall and Herklots. Fig. 3. EUPLECTELLA SUBEREA Wy. Thomson. Fig. 4-5. EUPLECTELLA JOVIS. O. Schmidt.

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Entire view, after the restoration made by Sir Wyville Thomson from a somewhat damaged specimen ; natural size.

Gec. West. Lith. ad. nat.

W. & A.K. Johnston, Lithographers

TAEGERIA PULCHRA F.E. Schulze

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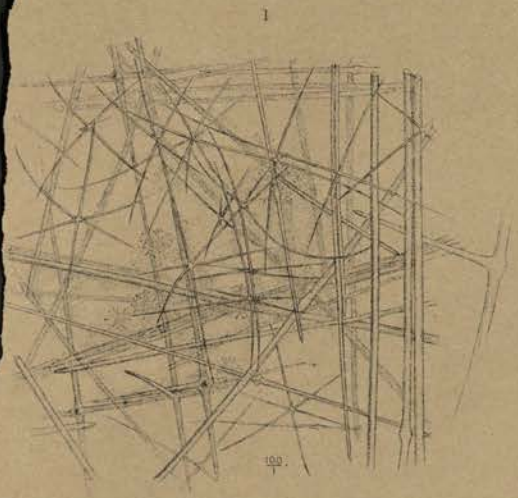
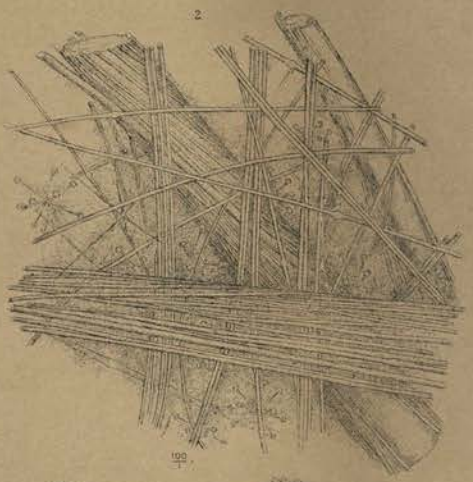
ig. 5. Fragment of a graphiohexaster from the parenchyma near the outer surface of the side wall; × 500.

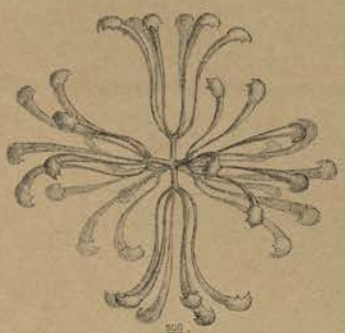
ig. 6. Section through the entire thickness of the sponge, showing the arrangement of the connected and loose spicules; × 175.

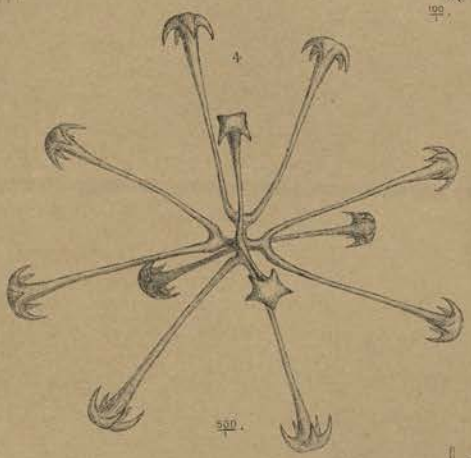
g. 7. From the lower part of sponge, inside; × 100.

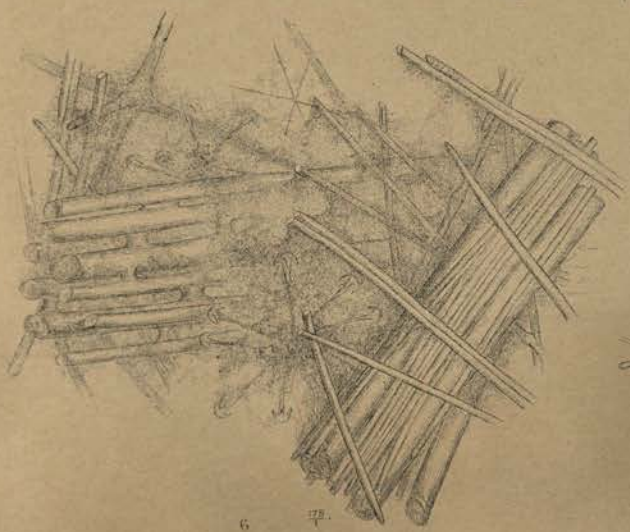
This plate was arranged by Sir Wyville Thomson.











W. & A.K. Johnston, Lithographers.

Gen. West, Lith. ad. nat.

TAEGERIA PULCHRA. F.E. Schulze

PLATE IX.

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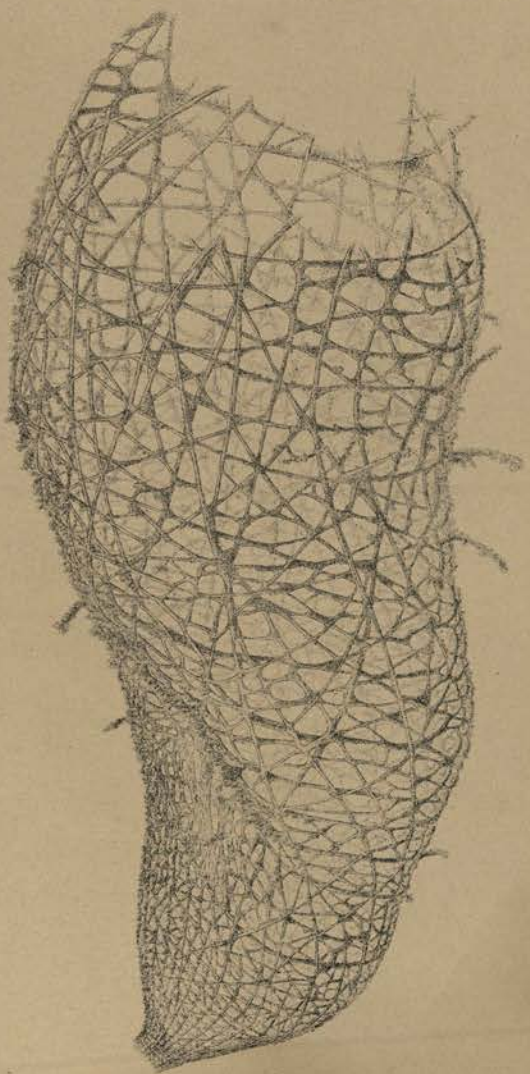
Walteria flemmingii, F. E. S., ... 96

Damaged specimen, preserved in alcohol with the soft parts ; natural size.



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WALTERIA FLEMMINGI F. E. Schulze

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PLATE X.

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Fig. 2. Floricome ; × 500.

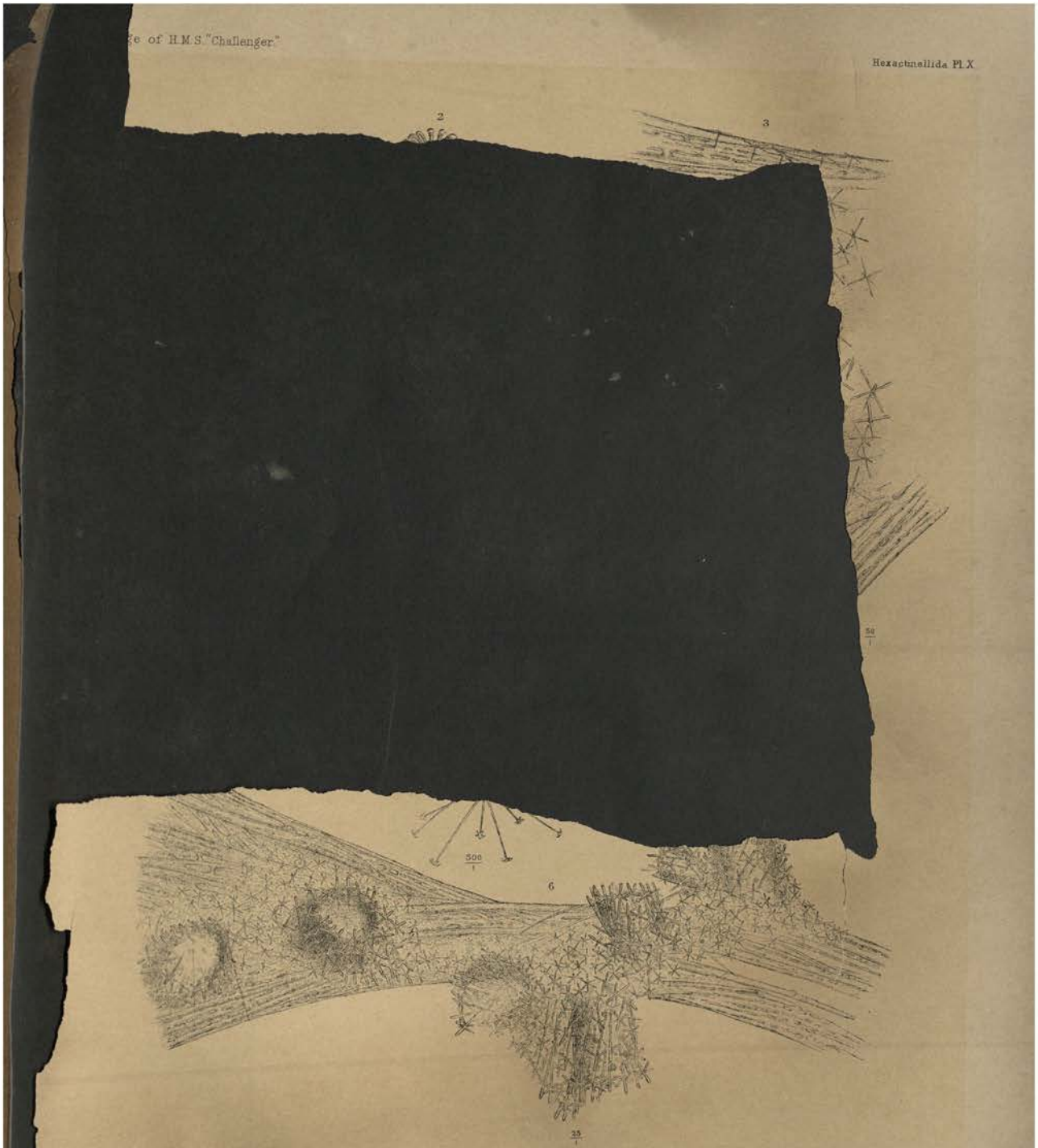
Fig. 3. Fragment of the tube wall, outside; × 50.

Fig. 4. Fragment of the framework of the tube wall, outside ; × 6.

Fig. 5. Discohexaster from the parenchyma ; × 500.

Fig. 6. Fragment of the framework of the tube wall, outside ; × 25.

This plate was arranged by Sir Wyville Thomson.



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W. & A.K. Johnston, Lithographers.

WALTERIA FLEMMINGI F. E. Schulze

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Figs. 1–3. *Tægeria pulchra*, F. E. S., ... 94

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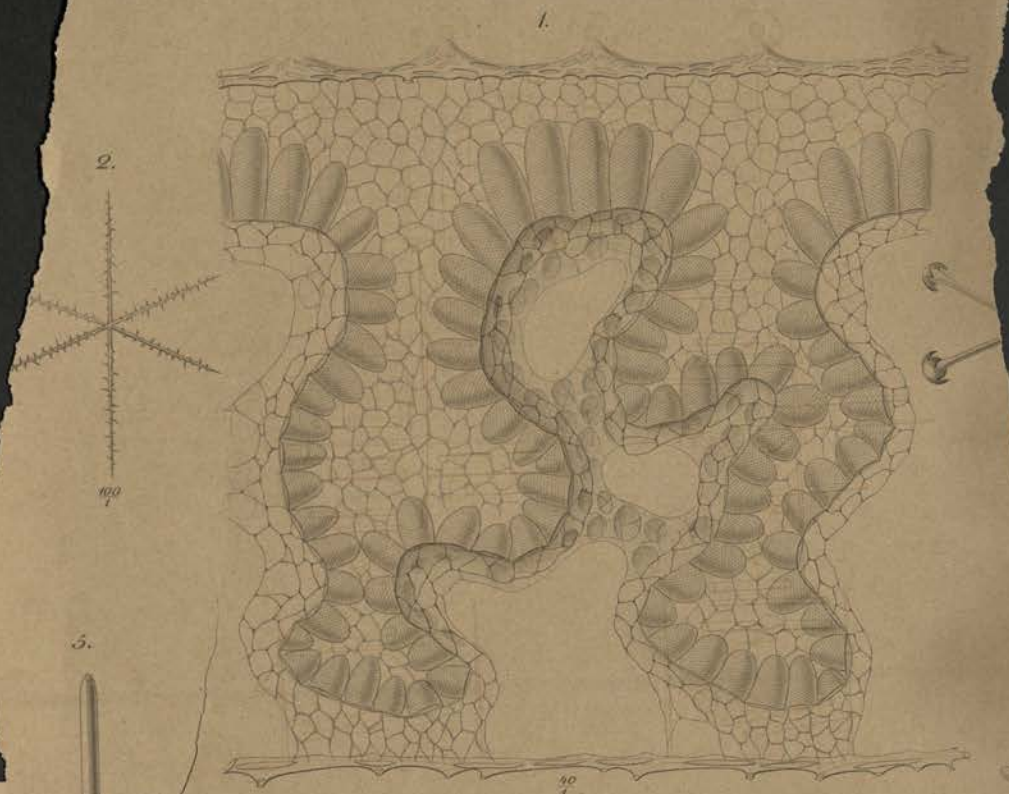

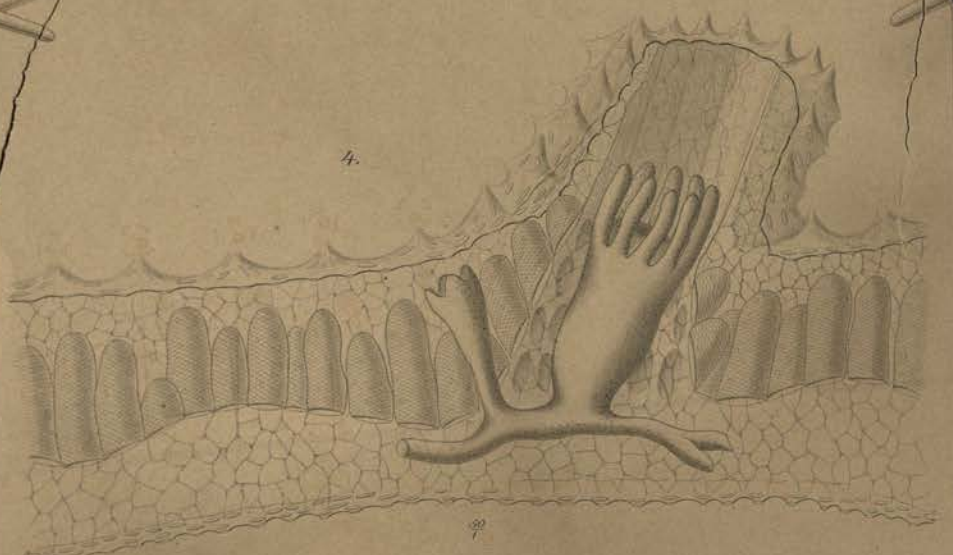

Fig. 1-3. TAEGERIA PULCHRA. F.E.Schulze. Fig. 4-6. WALTERIA FLEMMINGII. F.E.Schulze.

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Fig. 12. Oxyhexaster, in which the principals are so shortened, that the terminal rays have coalesced at their base; × 300.

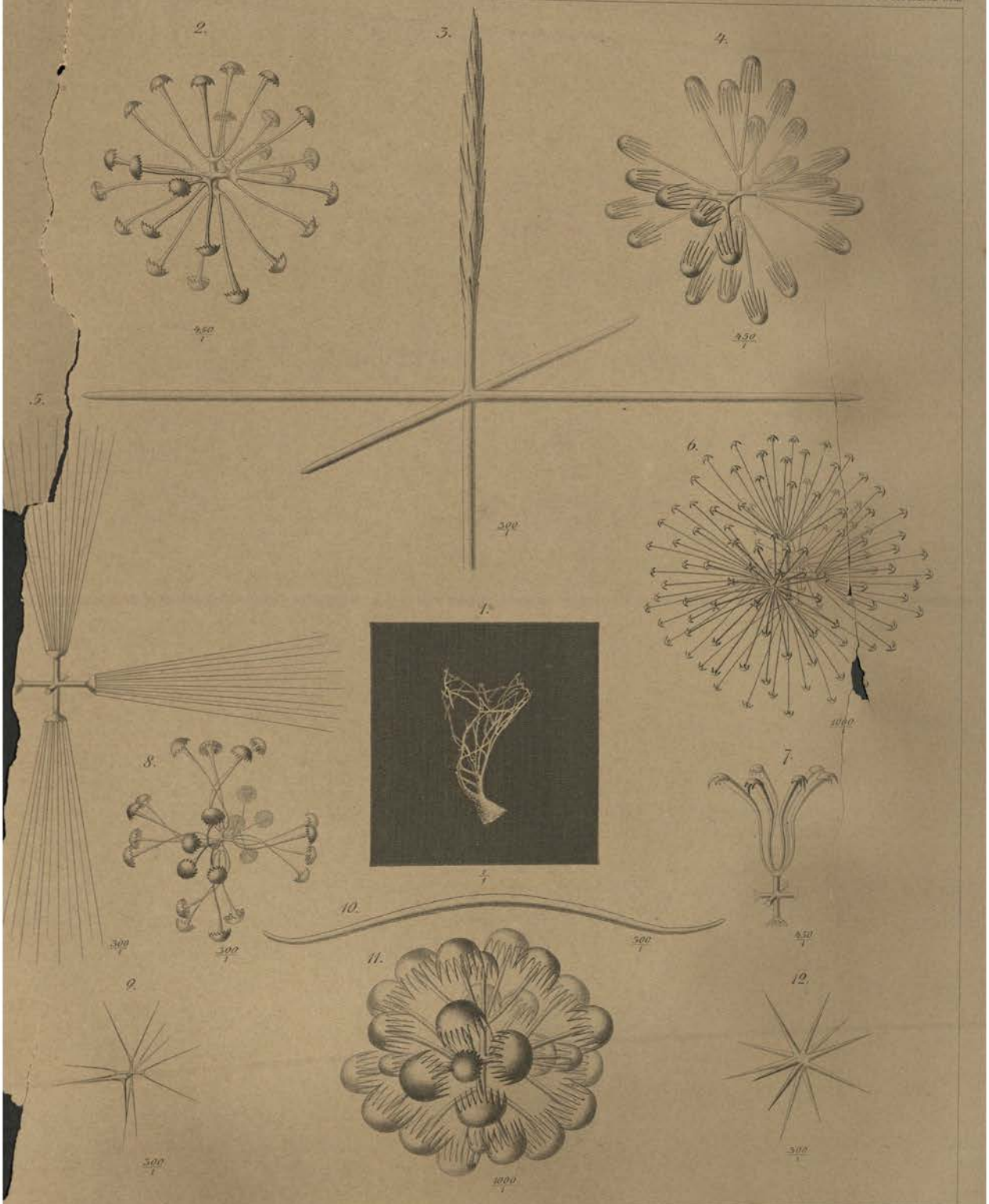

Fig. 1-7. DICTYOCALYX GRACILIS. F.E. Schulze. Fig. 8-12. RHABDOPECTELLA TINTINNUS. O. Schmidt.

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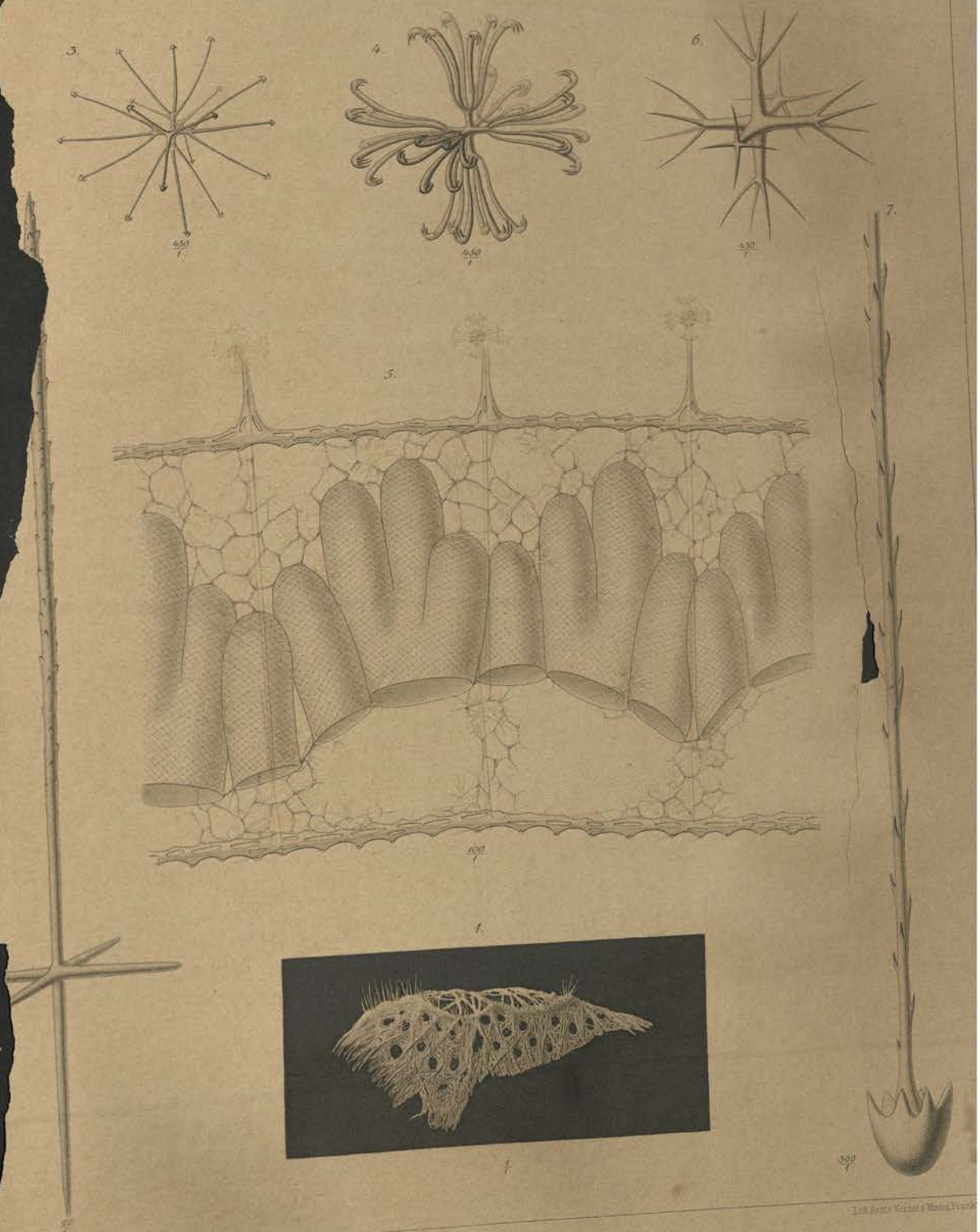

Lith. Anst. v. Werner & Winter, Frankf.

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Fig. 5. Inferior portion of an anchor-like diact of the basal tuft : × 300.

Figs. 6–13. *Holascus stellatus*, F. E. S., . . . 86

Fig. 6. Section at right angles through the lateral wall of *Holascus stellatus*, F. E. S., with the soft parts (combination figure); × 50.

Fig. 7. Oxyhexaster with curved terminal rays ; × 300.

Fig. 8. Oxyhexact with curved rays ; × 300.

Fig. 9. Discohexaster ; × 300.

Figs. 10–12. Spicules with four, three, or two much curved rays, and a central globular thickening ; × 300.

Fig. 13. Oxyhexaster with bent terminal rays ; × 300.

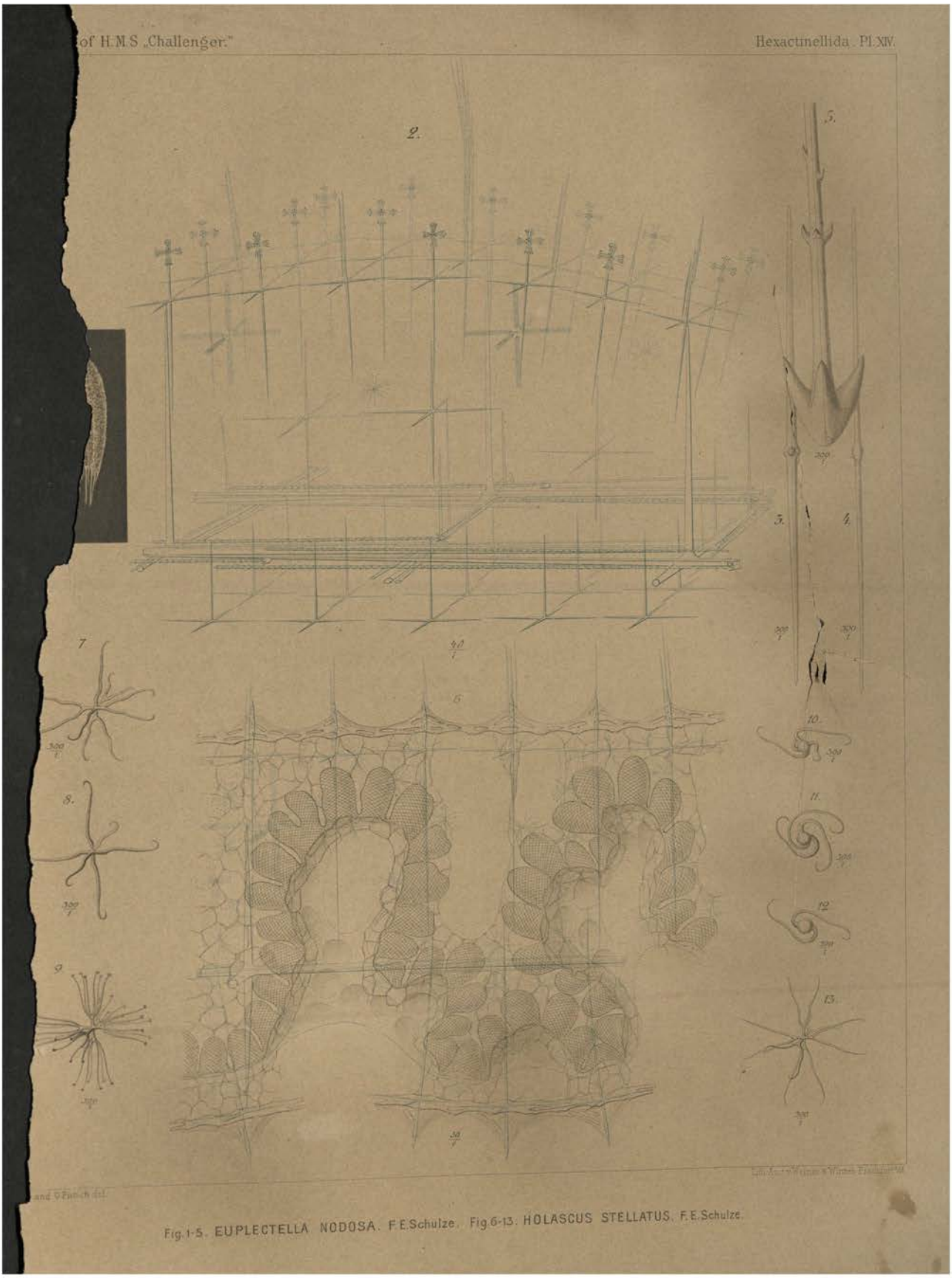

Fig.1-5. EUPLECTELLA NODOSA. F.E.Schulze. Fig.6-13. HOLASCUS STELLATUS. F.E.Schulze.

PLATE XV.

PLATE XV.

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Figs. 1–5. *Holascus fibulatus*, F. E. S., ... 87

Fig. 1. Damaged fragment, inferior portion with the basal tuft; natural size.

Fig. 2. Fragment of the same specimen (fig. 1), inside; × 50.

Fig. 3*a*. Three-rayed spicule; 3*b*, *c*, *d*, two-rayed spicules or fibulæ, from the same specimen (fig. 1); × 500.

Fig. 4. Middle part of a pentact from the same specimen (fig. 1); × 200.

Fig. 5. Central fragment of a rosette, from the same specimen (fig. 1); × 500.

Figs. 6–13. *Holascus stellatus*, F. E. S., ... 86

Fig. 6. Specimen, preserved in alcohol; natural size.

Fig. 7. Fragment of the same specimen (fig. 6), outside view; × 50.

Fig. 8. Part of a hypodermal hexact with a comital diact, from the same specimen (fig. 6); × 200.

Fig. 9. Oxyhexaster with curved terminal rays, from the same specimen (fig. 6); × 500.

Fig. 10. Three-rayed spicule with bent rays and central node, from the same specimen (fig. 6); × 500.

Figs. 11, 12. Oxyhexasters of the specimen shown in fig. 6; × 500.

Fig. 13. Inferior anchor-like end of spicule from the basal tuft of the specimen shown in fig. 6.

Figs. 14–23. *Holascus* sp., ... 86

Fig. 14. Part of the wall of a specimen which was not in my hands; natural size.

Fig. 15. Fragment of the outer portion of the wall of the specimen shown in fig. 14; × 50.

Fig. 16. Part of a hypodermal hexact with a comital diact, from the specimen shown in fig. 14; × 200.

Fig. 17. Fragment of a discohexaster, from the specimen shown in fig. 14; × 500.

Fig. 18. Fragment of a floricome-like discohexaster, from the specimen shown in fig. 14; × 500.

Fig. 19. Graphiohexaster from the specimen shown in fig. 14; × 500.

Fig. 20. Discohexaster from the specimen shown in fig. 14; × 500.

Fig. 21. Central part of a graphiohexaster, from the specimen shown in fig. 14; × 500.

Fig. 22. Discohexact from the specimen shown in fig. 14; × 500.

Fig. 23. Discohexaster from the specimen shown in fig. 14; × 500.

This plate was arranged by Sir Wyville Thomson.

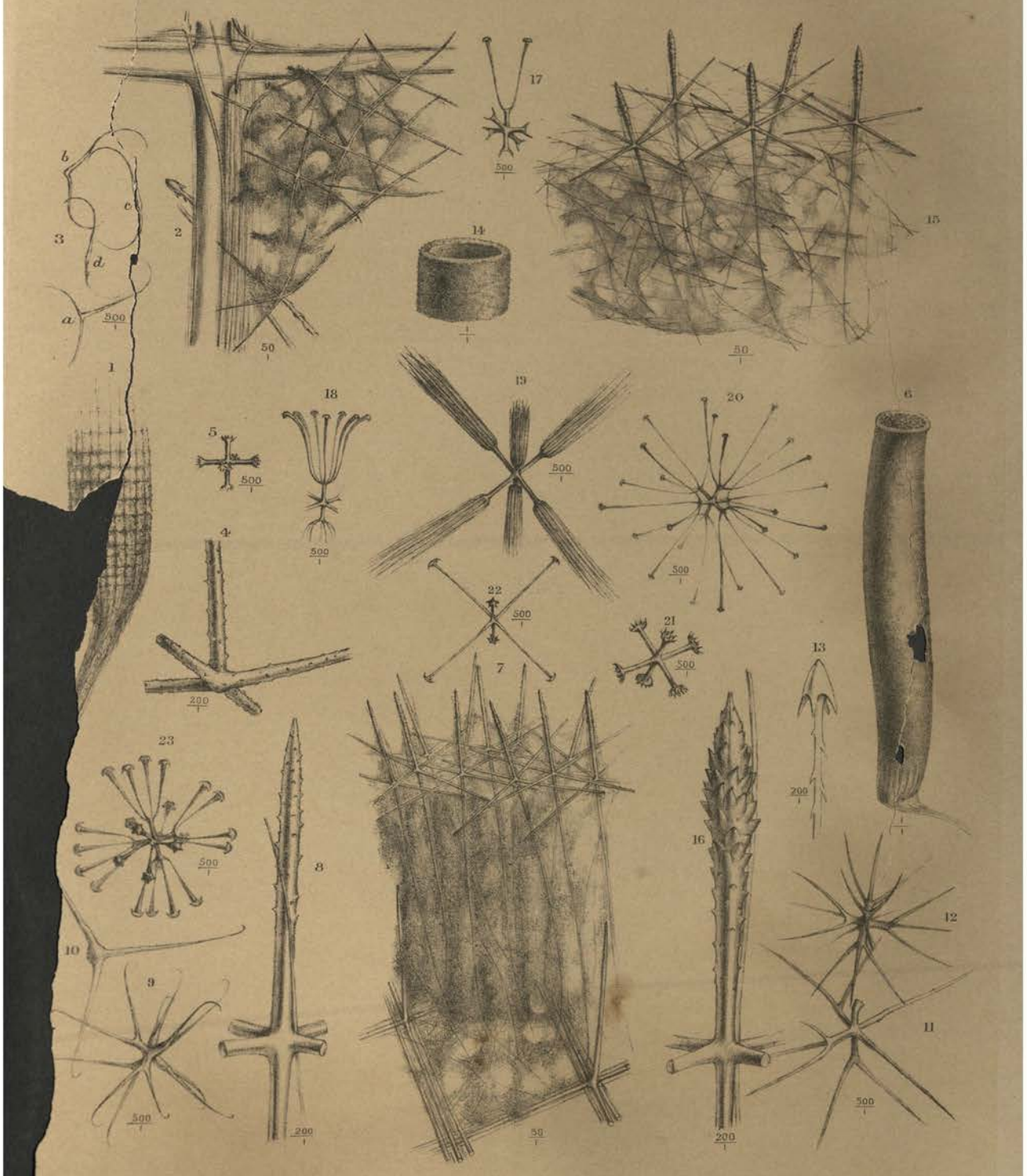


FIG. 1-5 HOLASCUS FIBULATUS, F. E. Schulze.

FIG. 6-23 HOLASCUS STELLATUS, F. E. Schulze.

PLATE XVI.

PLATE XVI.

PAGE

Holascus fibulatus, F. E. S., ... 87

Fig. 1. Superior portion of a defective specimen preserved in alcohol; natural size.

Fig. 2. Section at right angles through the lateral wall of the specimen shown in fig. 1 (combination figure); × 30.

Figs. 3, 4. Triacts with bent rays, from the trabecular framework; × 450.

Figs. 5–7. Fibulæ from the trabecular framework; × 450.

Fig. 8. Part of a principal hexact with small comital diacts, from the terminal sieve-plate; × 50.

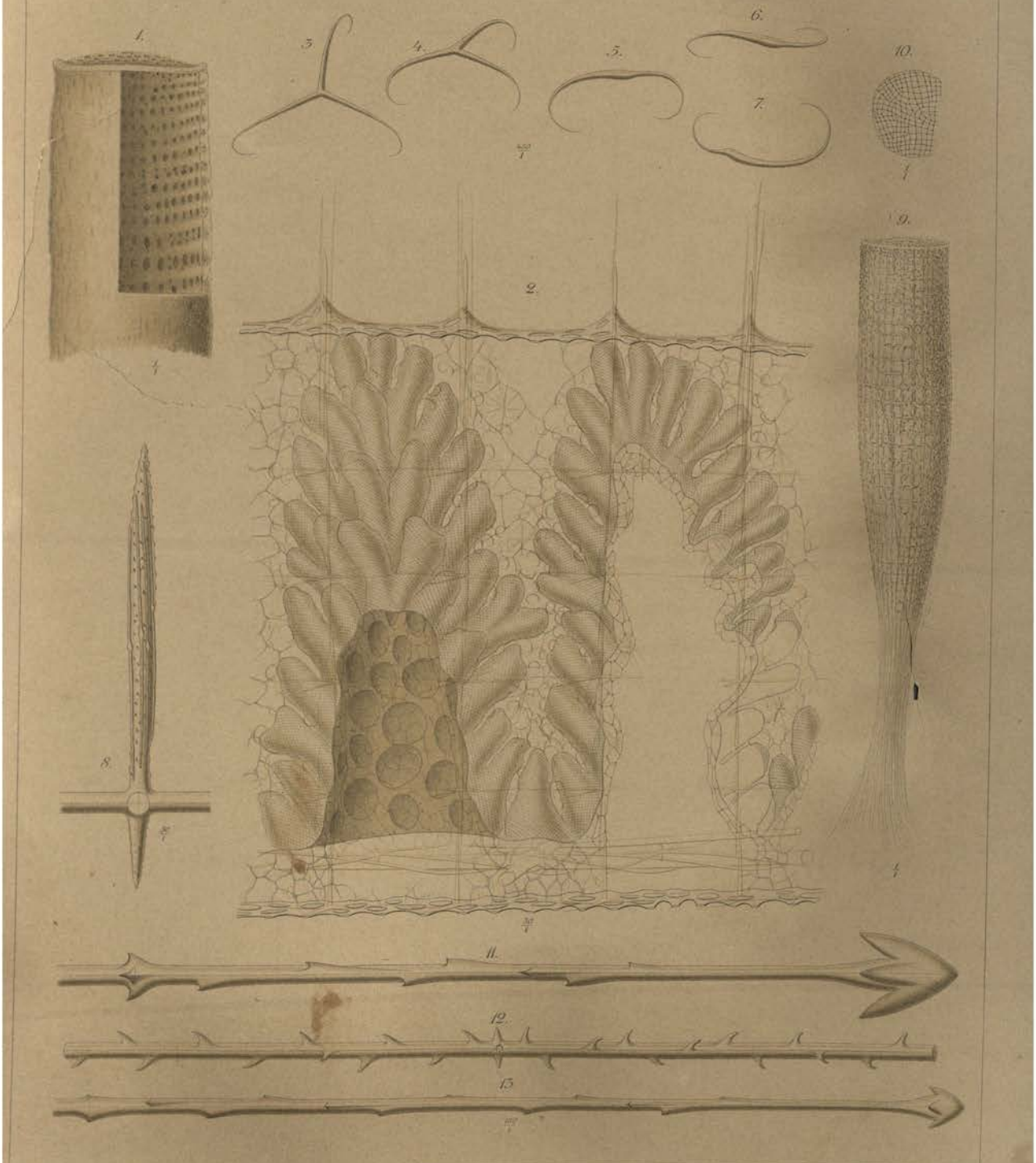
Fig. 9. A macerated specimen; natural size.

Fig. 10. Terminal sieve-plate of the specimen shown in fig. 9; natural size.

Fig. 11. Inferior portion of an anchor-like diact from the basal tuft of the specimen, shown in fig. 9; × 100.

Fig. 12. Middle part of an oxydiact from the inferior portion of the wall of the specimen shown in fig. 9; × 100.

Fig. 13. Inferior portion of an anchor-like diact from the basal tuft of the specimen shown in fig. 9; × 100.



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HOLASCUS FIBULATUS. F.E. Schulze

PLATE XVII.

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Figs. 1–5. *Holascus polejaëvii*, F. E. S., . . . 89

Fig. 1. Single specimen of *Holascus polejaëvii*, F. E. S., preserved in alcohol, somewhat injured at the upper end; natural size.

Fig. 2. Section at right angles through the lateral wall (combination figure); × 100.

Fig. 3. Oxyhexact from the trabecular framework; × 300.

Fig. 4. Oxyhexact with strong principal rays, from the trabecular framework; × 300.

Fig. 5. Hypodermal hexact with comital diacts, from the dermal skeleton; × 300.

Figs. 6–8. *Holascus ridleyi*, F. E. S., ... 90

Fig. 6. Part of a principal tetract with comitalia; × 300.

Fig. 7. Oxyhexaster with curved terminal rays; × 300.

Fig. 8. Oxyhexaster with straight terminal rays: × 300

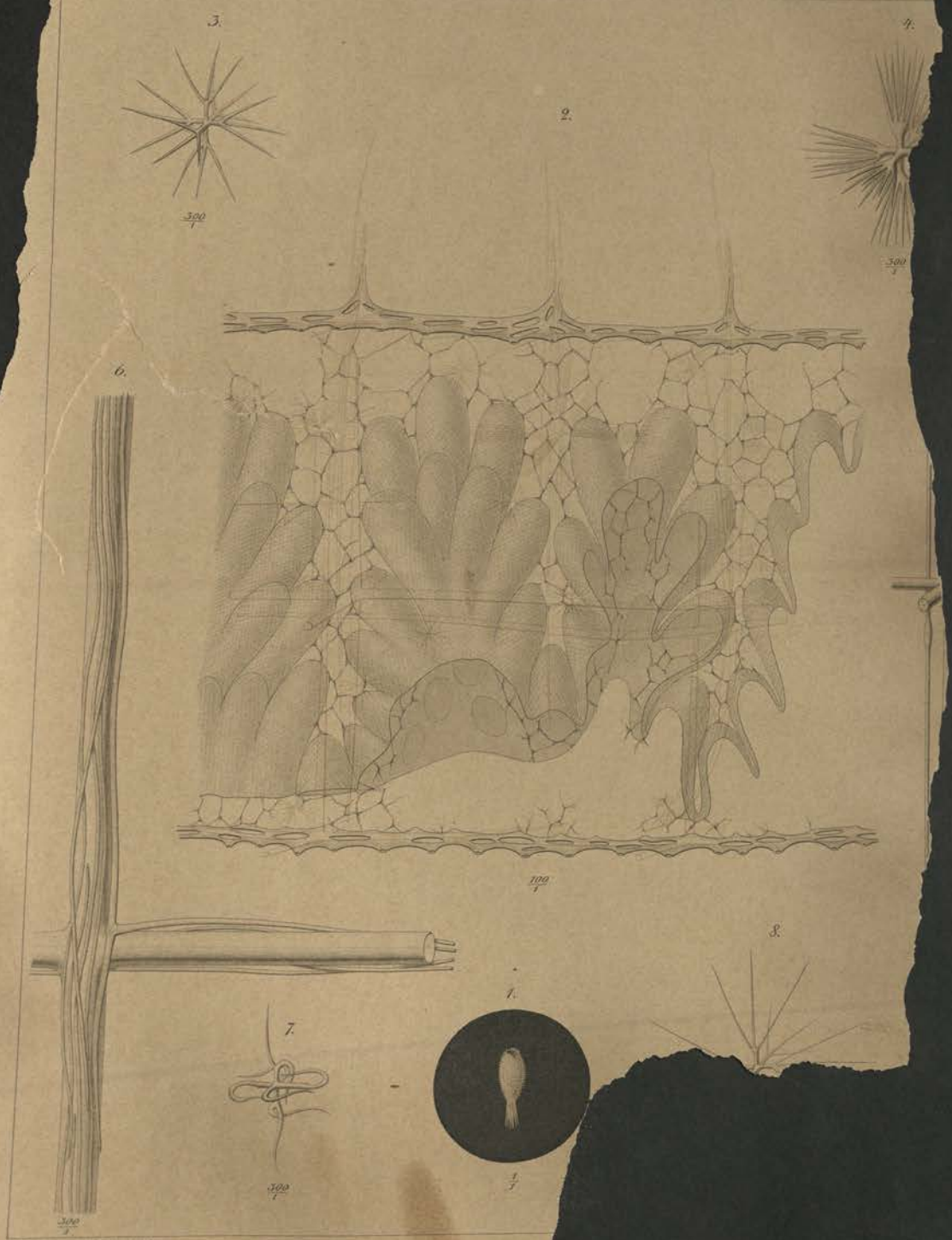

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Fig. 1-5. HOLASCUS POLEJAEVII. F. E. Schulze.

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Malacosaccus vastus, F. E. S., ... 91

Fig. 1. Part of the lateral wall, preserved in alcohol, inside view; natural size.

Fig. 2. Section at right angles through the entire wall (combination figure); × 20.

Fig. 3. Small discohexaster from the trabecular framework; × 450.

Fig. 4. Part of a floricome from the outer (dermal) surface; × 450.

Fig. 5. Part of a small discohexaster (fig. 3); × 1000.

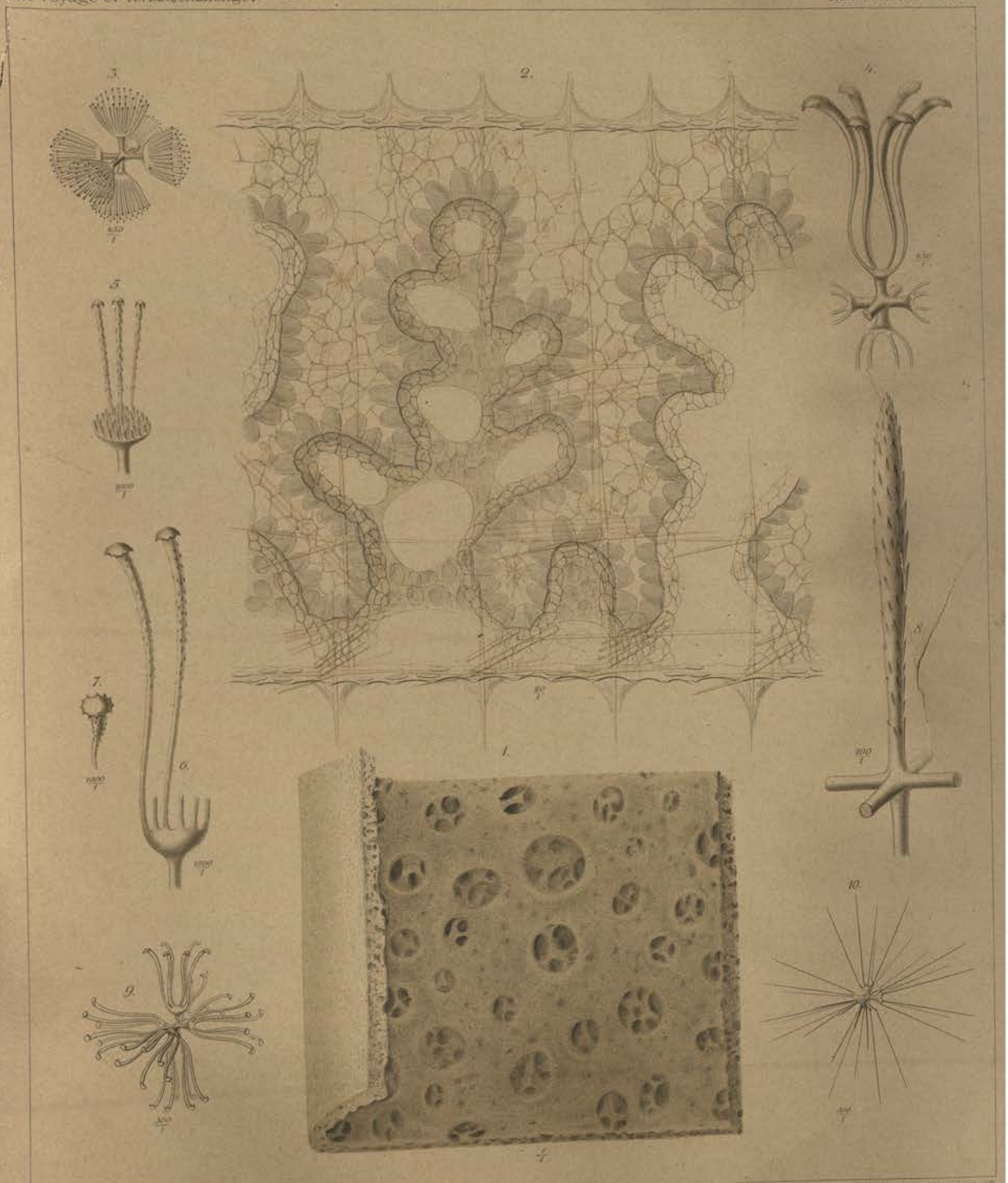
Fig. 6. Part of a floricome from the inner (gastral) surface; × 1000.

Fig. 7. Terminal ray of a floricome from the inner (gastral) surface; × 1000.

Fig. 8. Part of a hypodermal hexact; × 100.

Fig. 9. Floricome from the inner (gastral) surface; × 300.

Fig. 10. Oxyhexaster with very slender long terminal rays; × 300.



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MALACOSACCUS VASTUS. F.E. Schulze.

PLATE XIX.

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Malacosaccus unguiculatus, F. E. S., ... PAGE 93

Fig. 1. Somewhat injured specimen of *Malacosaccus unguiculatus*, F. E. S., preserved in alcohol; natural size.

Fig. 2. Section at right angles through the lateral wall (combination figure); × 35.

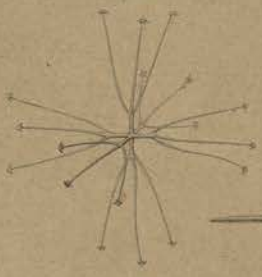
Fig. 3. Discohexaster from the trabecular framework; × 300.

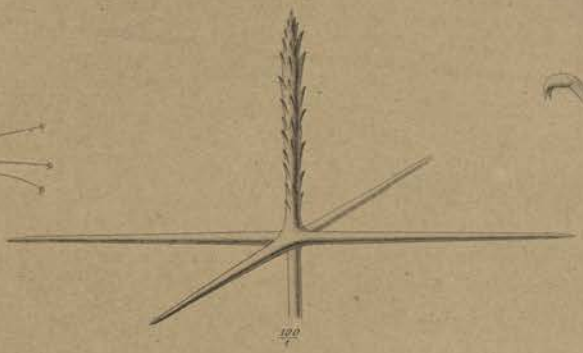
Fig. 4. Hypodermal hexact from the dermal skeleton; × 100.

Fig. 5. Fragment of a floricome; × 450.

Fig. 6. Floricome; × 300.

Fig. 7. Oxyhexaster; × 300.





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MALACOSACCUS UNGUICULATUS F.E.Schulze.

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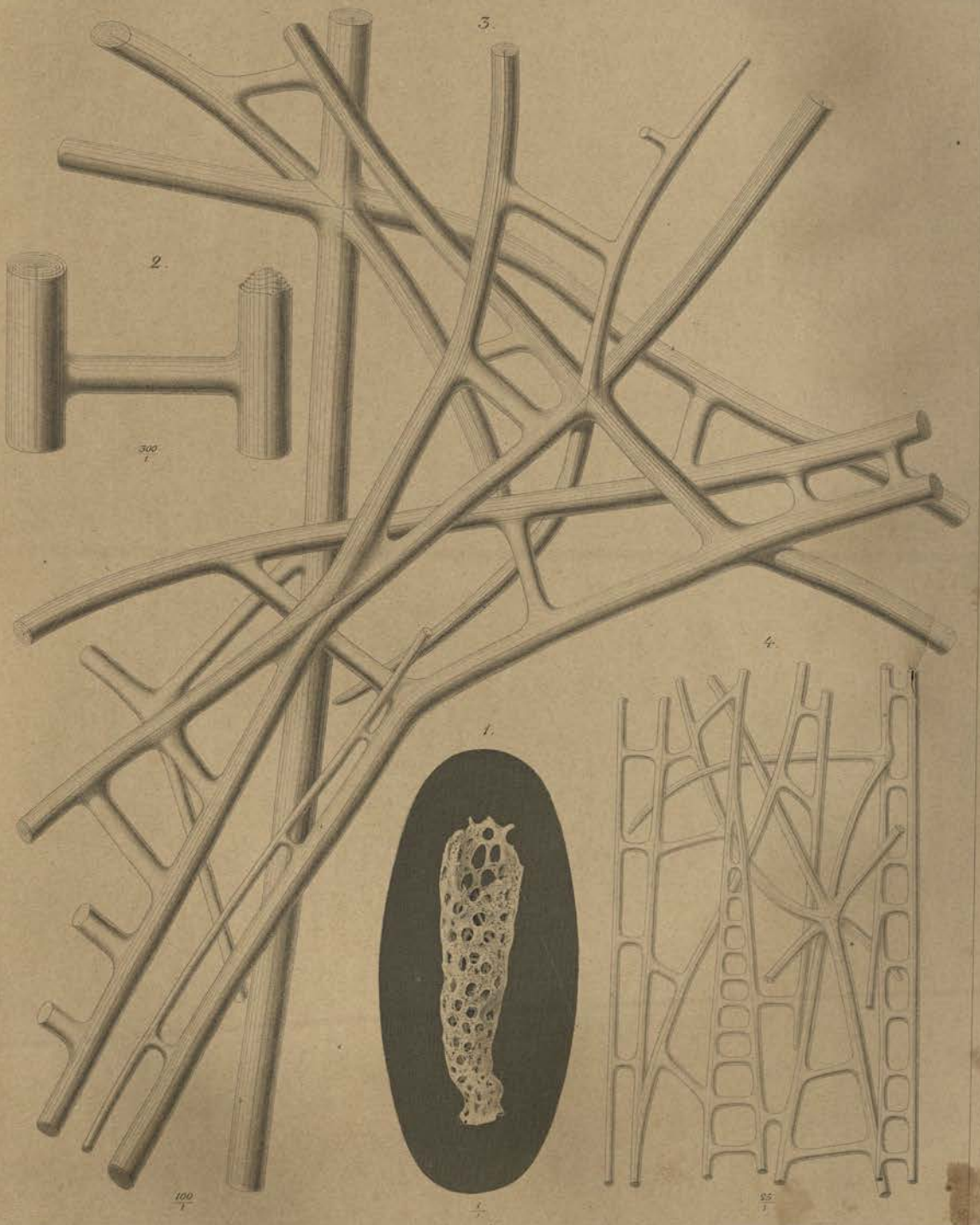
Rhabdodictyum delicatum, O. Schmidt, ... 107

Fig. 1. Macerated skeleton of a specimen of *Rhabdodictyum delicatum*, O. Schmidt; natural size.

Fig. 2. Two spicules connected by a synapticulum; × 300.

Fig. 3. Part of the framework of the connected principalia; × 100.

Fig. 4. Part of the framework of the connected principalia, with some ladder-like structures; × 25.



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RHABDODICTYUM DELICATUM O. Schmidt.

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Asconema setubalense, Saville Kent., ... 116

Fig. 1. Inferior part of a defective specimen, preserved in alcohol; natural size.

Fig. 2. Vertical section through the lateral wall of the specimen shown in fig. 1 (combination figure); × 30.

Fig. 3. Small discohexaster from the trabecular framework; × 450.

Fig. 4. Autodermal pentact pinulus, with a rudiment of the sixth proximal radial ray; × 300.

Fig. 5. Autogastral hexact pinulus; × 300.

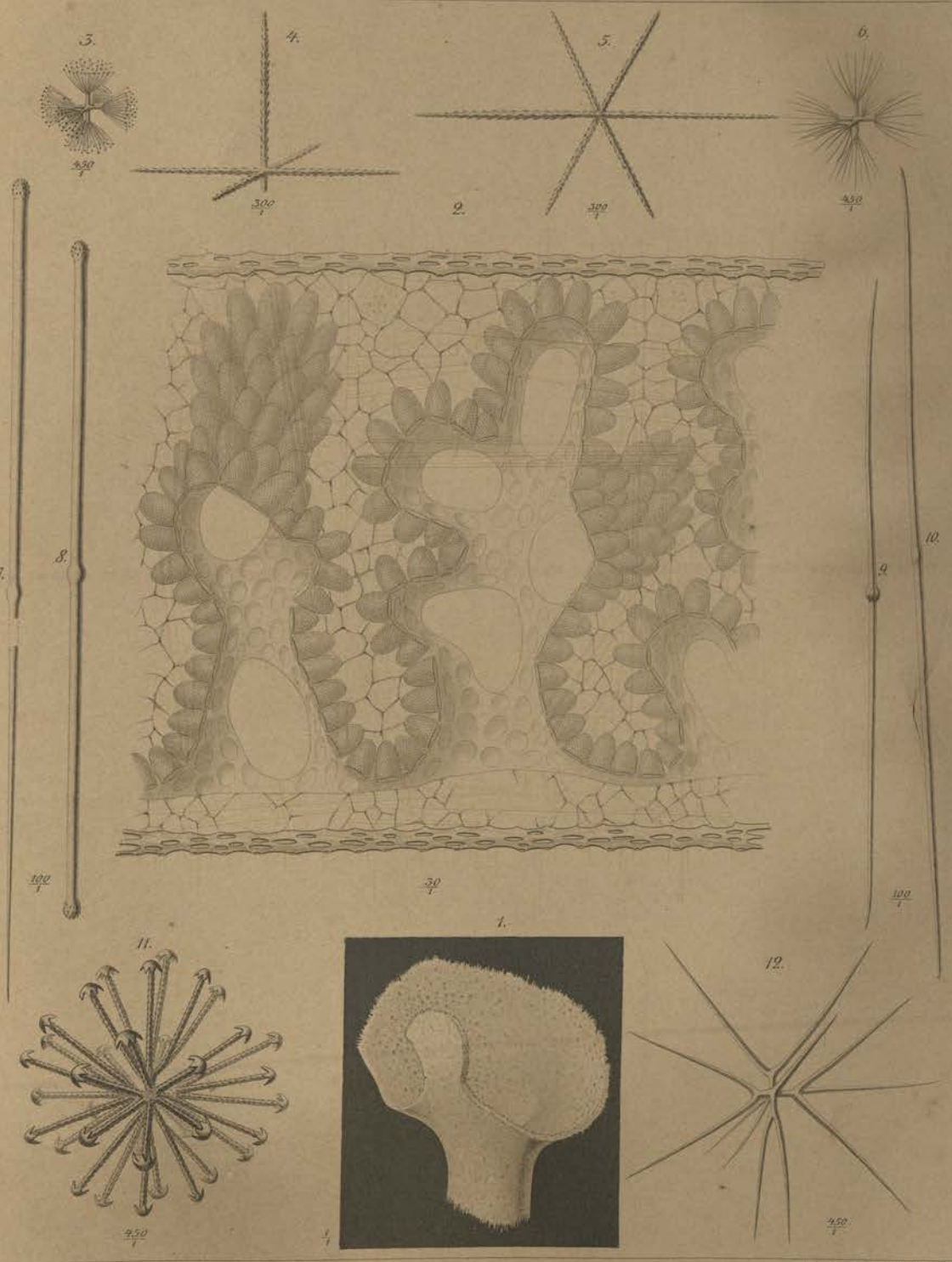
Fig. 6. Oxyhexaster from the trabecular framework; × 450.

Figs. 7, 8. Principal diacts with central thickening and one or two rough terminal knots; × 100.

Figs. 9, 10. Principal oxydiacts with central thickening or four cruciately disposed knobs; × 100.

Fig. 11. Discohexaster with echinated terminal rays; × 450.

Fig. 12. Oxyhexaster with long terminal rays; × 450.



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ASCONEMA SETUBALENSE. Saville Kent.

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Figs. 1–3. *Aulascus johnstoni*, F. E. S., . . . 118

Fig. 1. Somewhat damaged specimen, preserved in alcohol; natural size.

Fig. 2. Vertical section through the lateral wall of the specimen shown in fig. 1 (combination figure); × 30.

Fig. 3. Autodermal hexact pinulus; × 100.

Figs. 4–9. *Sympagella nux*, O. Schmidt, . . . 120

Fig. 4. Somewhat damaged specimen, preserved in alcohol; natural size.

Fig. 5. Vertical section through the upper part of the lateral wall of the specimen shown in fig. 4 (combination figure); × 30.

Fig. 6. Plumicome from the external trabecular framework near the gastral side; × 450.

Fig. 7. *a*, *b*, *c*. Roller stars ("Walzensterne," O. Schmidt), reduced oxyhexasters; × 450.

Fig. 8. Autodermal pentact pinulus with a rudiment of the sixth proximal radial ray; × 100.

Fig. 9. Autogastral hexact pinulus; × 100.

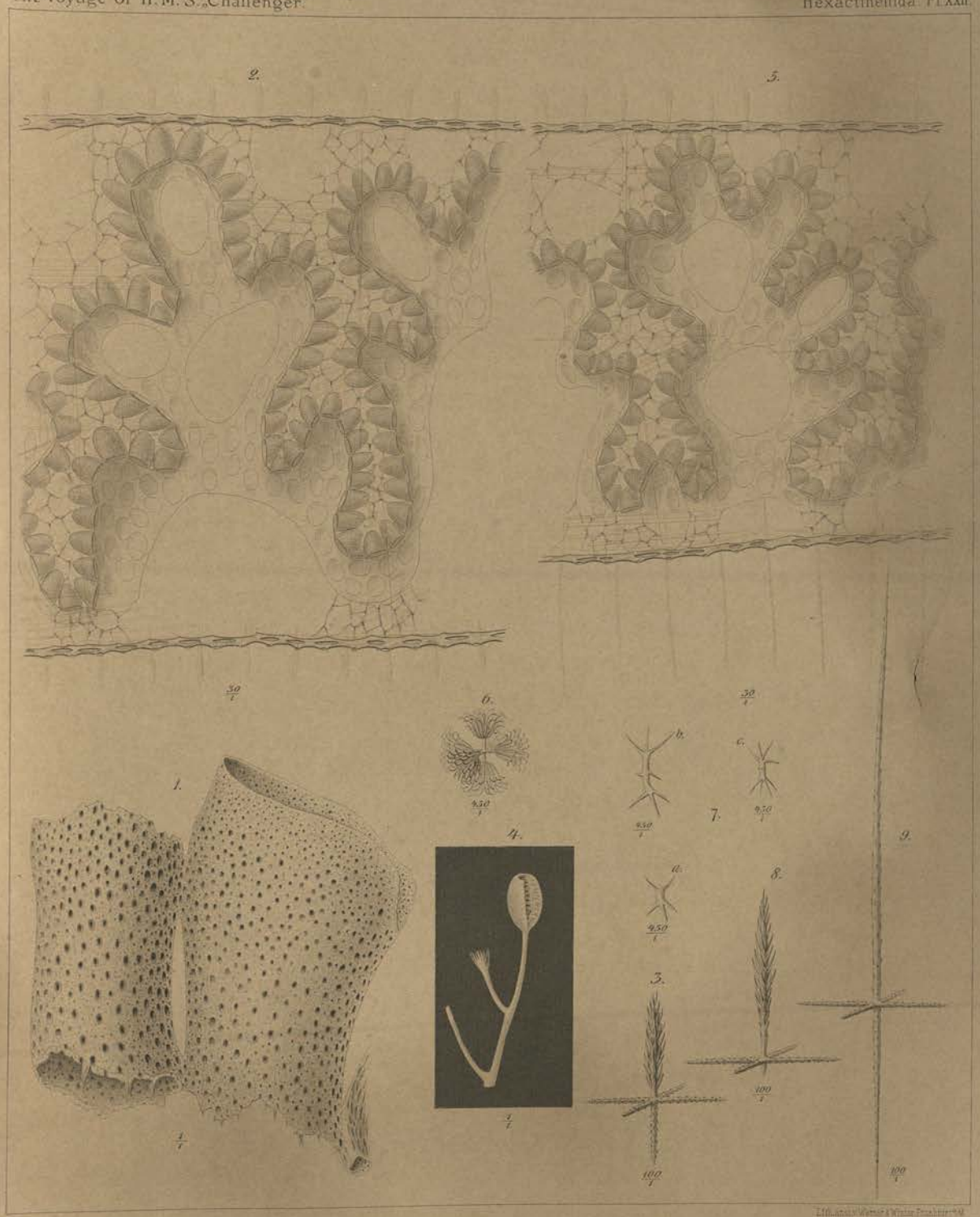

Fig. 1-3. AULASCUS JOHNSTONI. F.E. Schulze. Fig. 4-9. SYMPAGELLA NUX. O. Schmidt.

PLATE XXIII.

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PAGE

Figs. 1–8. *Polyrhabdus oviformis*, F. E. S., . . . 121

Fig. 1. A damaged specimen; natural size.

Fig. 2. Autogastral hexact pinulus; × 100.

Fig. 3. Discohexaster with short, thick, principal rays; × 300.

Fig. 4. Autodermal hexact pinulus; × 100.

Fig. 5. Principal hexact; × 100.

Figs. 6, 7, 8. Principal diacts with central thickening or four cruciately disposed knobs, and with rough thickened ends; × 100.

Figs. 9–14. *Balanites pipetta*, F. E. S., ... 122

Fig. 9. A damaged specimen, preserved in alcohol; natural size.

Figs. 10, 11. Discohexaster with long principal and numerous short terminal rays; × 300 and 450.

Fig. 12. Discohexaster with long principal rays and four terminals in every principal; × 300.

Fig. 13. Autodermal hexact pinulus; × 300.

Fig. 14. Vertical section through the marginal portion of the specimen figured in fig. 9 (combination figure); × 60.

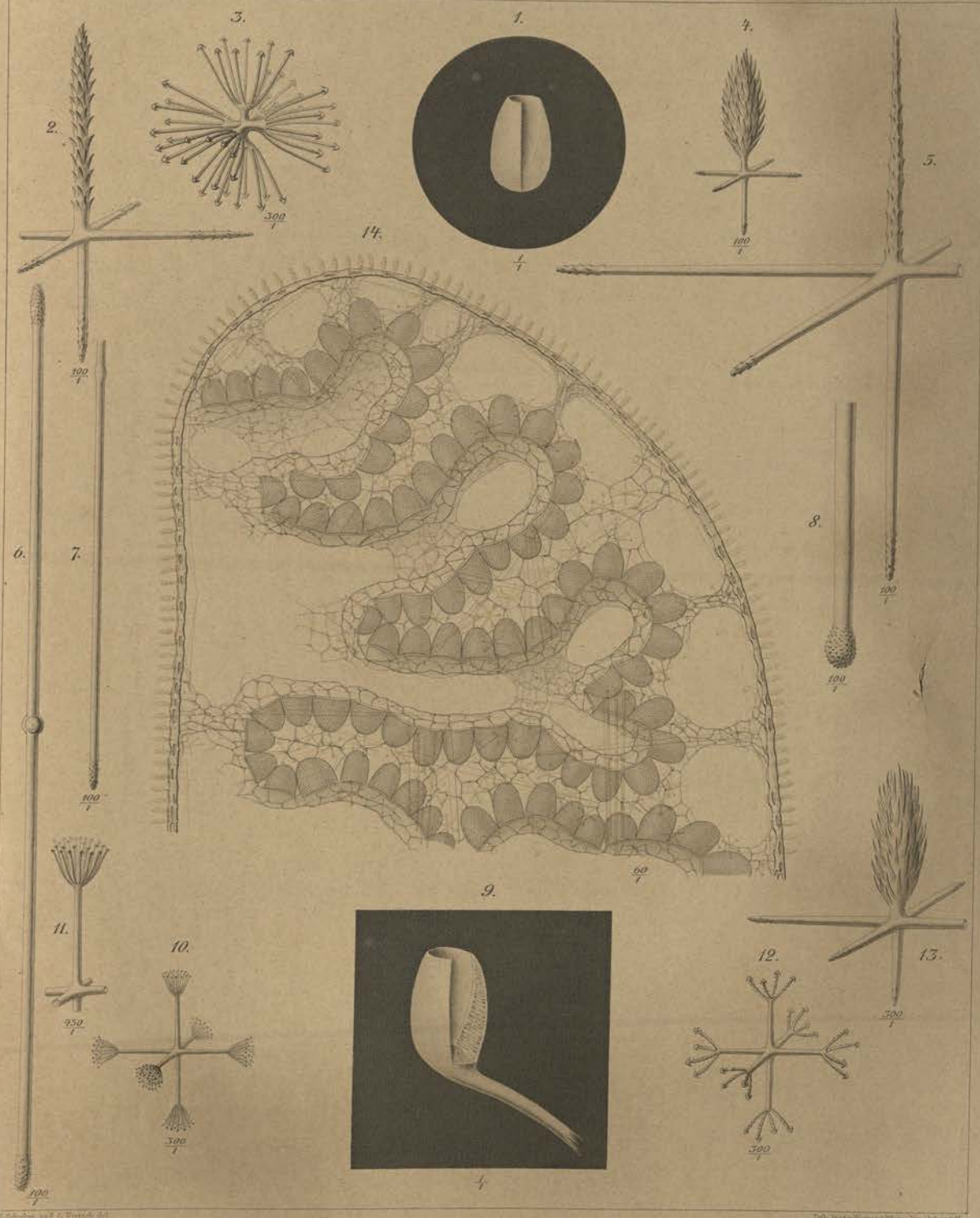

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Fig. 1-8. POLYRHABDUS OVIFORMIS. F. E. Schulze. Fig. 9-14. BALANITES PIPETTA. F. E. Schulze.

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Caulophacus latus, F. E. S., ... 124

Fig. 1. Vertical section of a somewhat damaged specimen, preserved in alcohol; natural size.

Fig. 2. Vertical section through the marginal portion of the specimen shown in fig. 1 (combination figure); × 30.

Fig. 3. Part of a longer autodermal pentact pinulus; × 100.

Fig. 4. Discohexaster with principal and terminal rays of equal length; × 100.

Fig. 5. Autogastral pentact pinulus; × 100.

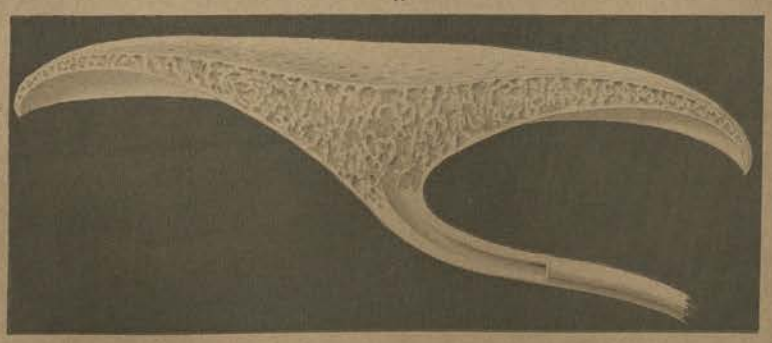
Fig. 6. Part of the discohexaster shown in fig. 4; × 450.

Fig. 7. Discohexact with echinated rays; × 100.

Fig. 8. Oxyhexaster; × 100.

Fig. 9. Interior part of an autogastral exceptionally hexact pinulus; × 100.

Fig. 10. Autodermal hexact pinulus; × 100.



CAULOPHACUS LATUS. F. E. Schulze.

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Caulophacus elegans, F. E. S., ... 126

Fig. 1. Superior part of a specimen, preserved in alcohol; natural size.

Fig. 2. Inferior part of the stalk of the specimen shown in fig. 1; natural size.

Fig. 3. Vertical section of the marginal portion of the body of the specimen shown in fig. 1 (combination figure); × 20.

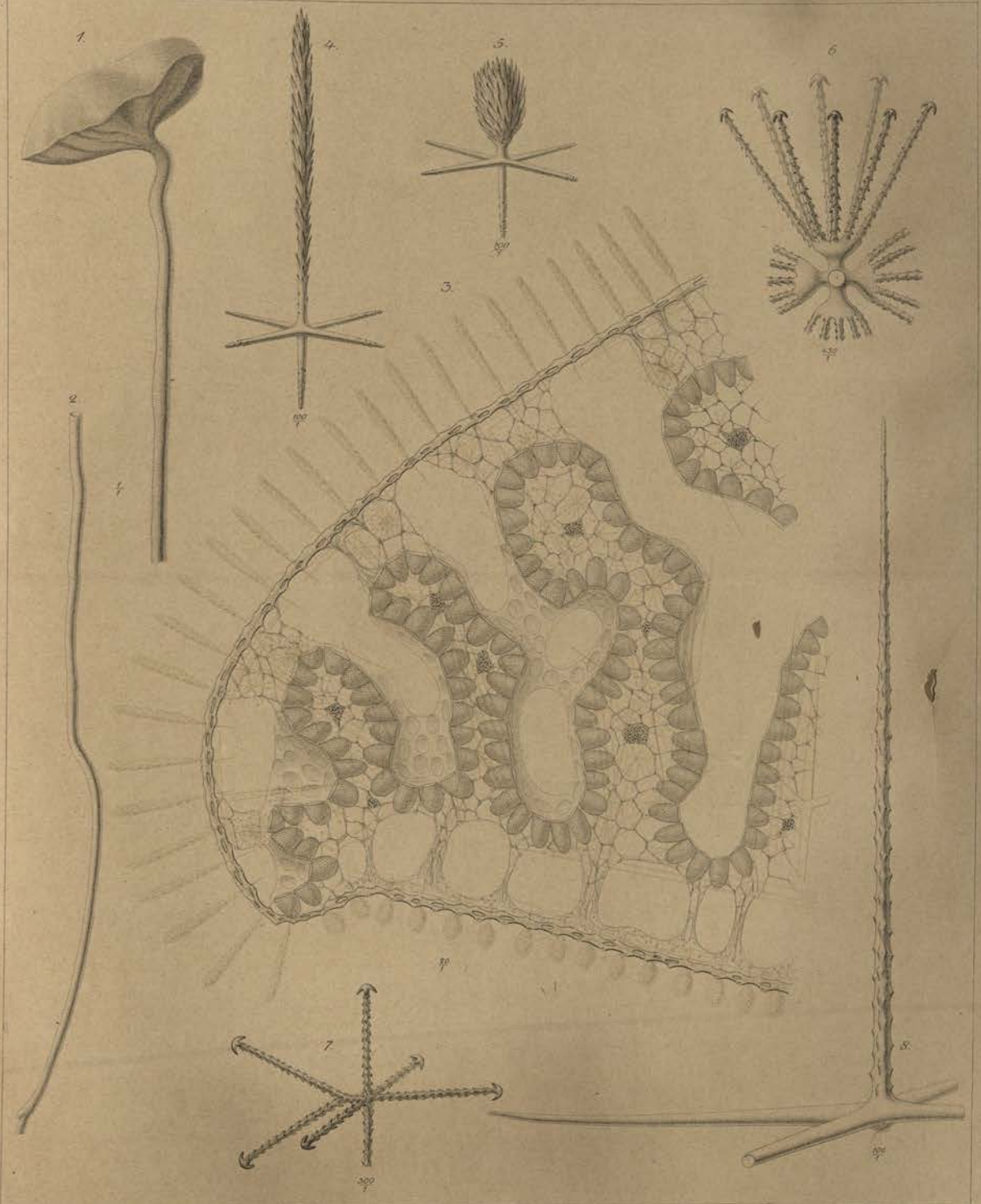
Fig. 4. Autogastral hexact pinulus; × 100.

Fig. 5. Autodermal hexact pinulus; × 100.

Fig. 6. Part of a discohexaster with echinated terminal rays; × 450.

Fig. 7. Discohexaster with five undivided rays; × 300.

Fig. 8. Hypodermal pentact with echinated proximal radial ray; × 100.



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CAULOPHACUS ELEGANS. F.E.Schulze.

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Figs. 1–3. *Caulophacus elegans*, F. E. S., . . 126

Fig. 1. A mushroom-like somewhat damaged specimen; natural size.

Fig. 2. Discohexaster with short principal rays; × 100.

Fig. 3. A broken stalk; natural size.

Figs. 4–9. *Trachycaulus gurlittii*, F. E. S., . . 128

Fig. 4. A broken stalk; natural size.

Fig. 5. Longitudinal section of the wall of the stalk shown in fig. 4; skeleton only; × 100.

Fig. 6. Transverse section of the wall of the stalk shown in fig. 4; skeleton only; × 100.

Fig. 7. Oxyhexaster with great sickle-like incurved terminal rays; × 300.

Fig. 8. Part of an oxyhexact with connected sickle-like incurved terminal rays; × 300.

Fig. 9. Autodermal hexact pinulus; × 300.

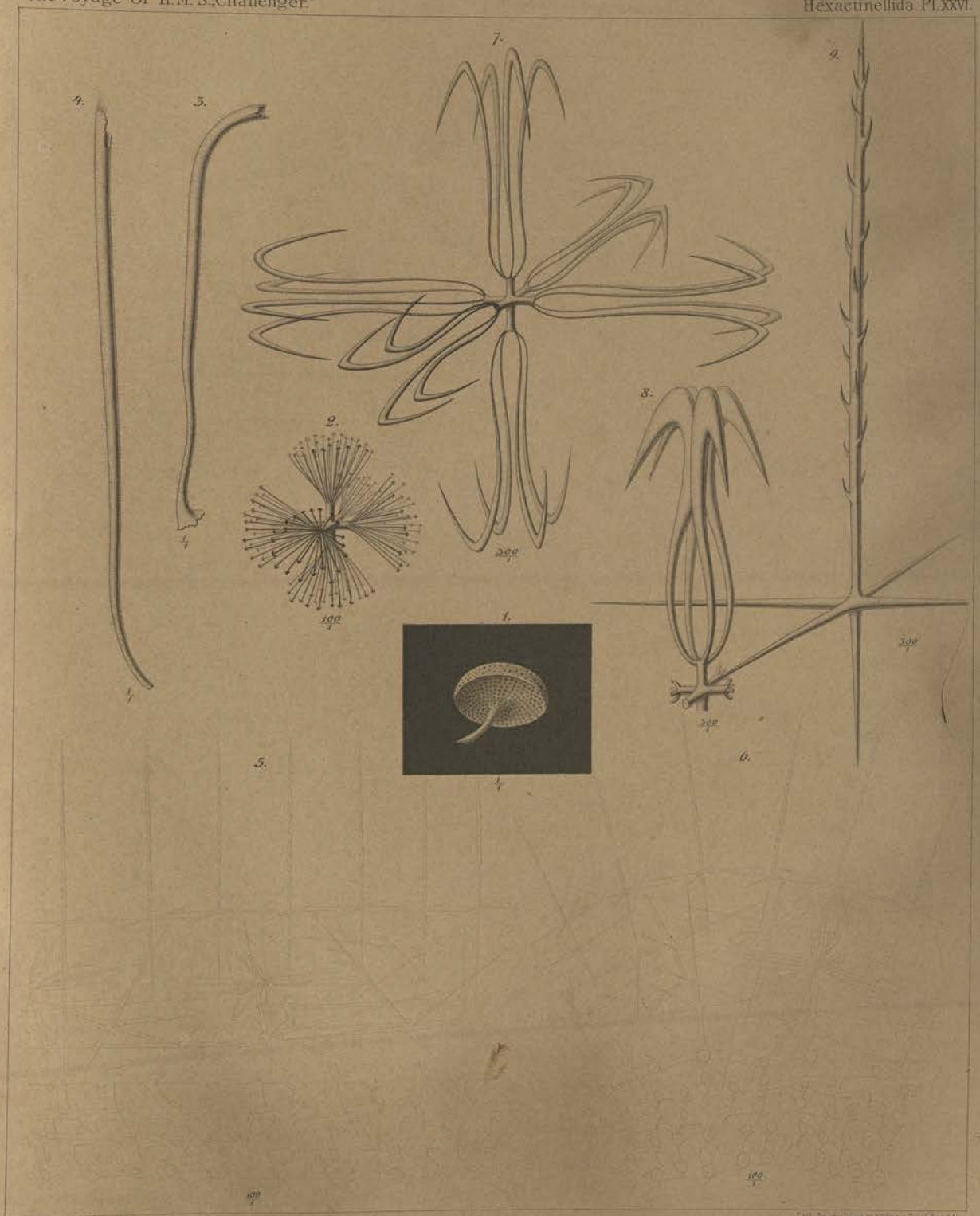

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Fig. 1-3. CAULOPHACUS ELEGANS. F.E. Schulze. Fig. 4-9. TRACHYCAULUS GURLITTII. F.E. Schulze.

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Figs. 1–13. *Hyalonema sieboldi*, Gray, ... 190

Fig. 1. A dried specimen without the *Palythoa*-investment of the basal tuft; $\times \frac{1}{3}$.

Fig. 2. Terminal sieve-plate, outer side view; natural size.

Fig. 3. Oxydiact with central thickening and barbs at both ends; × 300.

Figs. 4–6. Small amphidiscs of different sizes; × 300.

Fig. 7. Great amphidisc with knobbed axial beam; × 300.

Figs. 8, 9. Middle-sized amphidiscs; × 300.

Fig. 10. Oxyhexact with bent echinated rays; × 300.

Figs. 11, 12. Autodermal pentact pinules; × 300.

Fig. 13. Oxyhexact with straight echinated rays; × 300.

Figs. 14–23. *Hyalonema gracile*, F. E. S., . . . 196

Fig. 14. Longitudinal section of a somewhat damaged specimen, preserved in alcohol; natural size.

Figs. 15–17. Small amphidiscs of different sizes; × 300.

Fig. 18. Principal triact with rough ends; × 300.

Fig. 19. Greater amphidisc with echinated axial beam; × 300.

Fig. 20. Oxyhexact with straight, smooth rays; × 300.

Fig. 21. Autodermal pentact pinulus; × 300.

Fig. 22. Autogastral pentact pinulus; × 300.

Fig. 23. Oxyhexact with smooth bent rays; × 300.

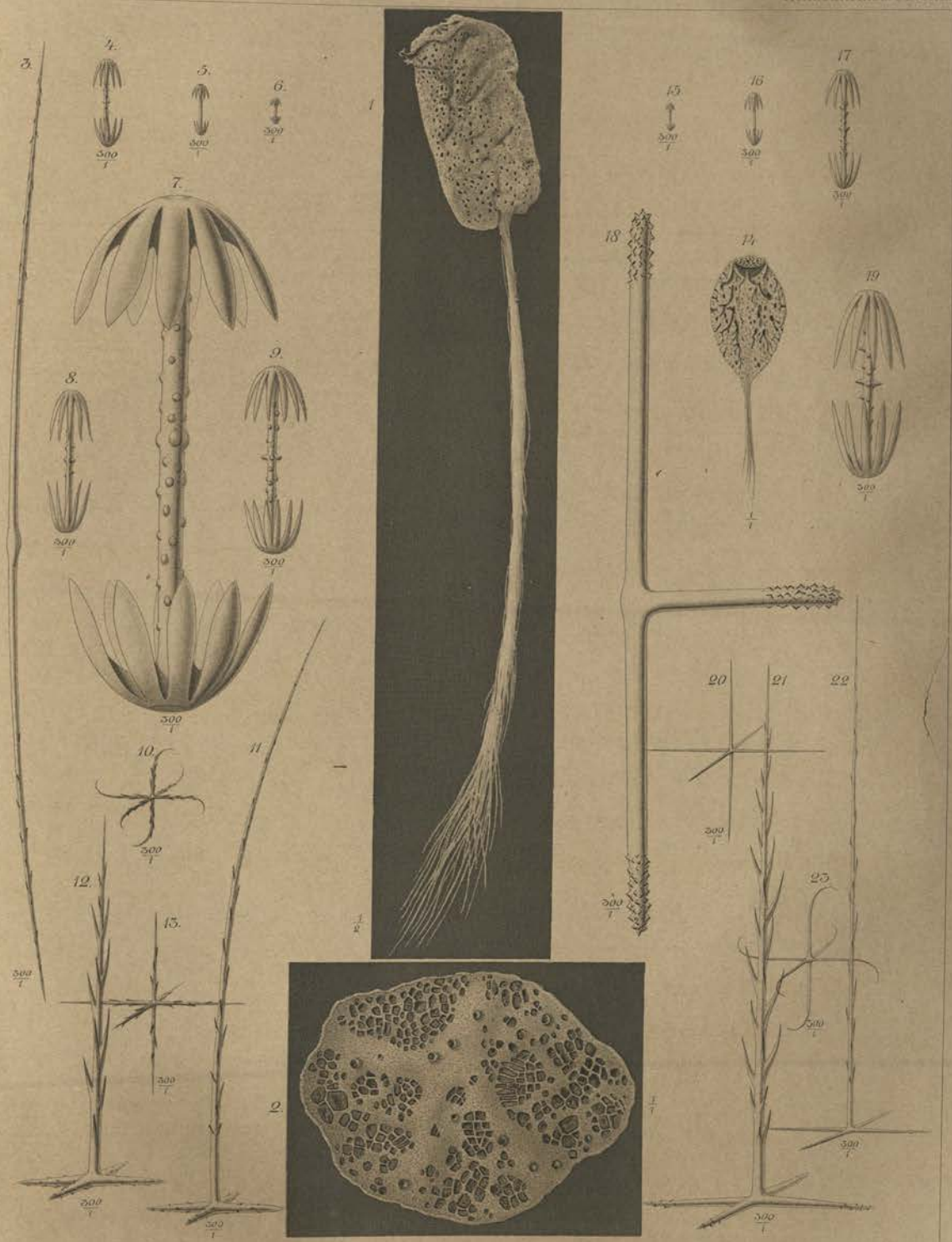

Fig. 1-13. HYALONEMA SIEBOLDI. J.E.Gray. Fig. 14-23. HYALONEMA GRACILE F.E.Schulze.

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Figs. 1–11. *Hyalonema divergens*, F. E. S., . . 199

Fig. 1. Somewhat damaged specimen, preserved in alcohol; natural size.

Fig. 2. Marginal oxydiact with four central knobs; × 100.

Fig. 3. Great amphidisc of the dermal membrane; × 300.

Figs. 4, 5. Smaller amphidiscs; × 300.

Fig. 6. Oxyhexact with smooth bent rays; × 300.

Fig. 7. Autodermal pentact pinulus; × 100.

Fig. 8. Oxyhexact with smooth straight rays; × 300.

Fig. 9. Oxyhexact with smooth bent rays; × 300.

Figs. 10, 11. Strong short spicules, triact and tetract, with rough ends, from the basal pad of the body; × 100.

Figs. 12–17. *Hyalonema lusitanicum*, Bocage, . . 225

Fig. 12. Small amphidisc; × 300.

Fig. 13. Middle-sized amphidisc; × 300.

Fig. 14. Greater amphidisc with nodular axial beam; × 300.

Fig. 15. Oxyhexact with smooth bent rays; × 300.

Fig. 16. Oxyhexact with smooth straight rays; × 300.

Fig. 17. Autodermal pentact pinulus; × 300.

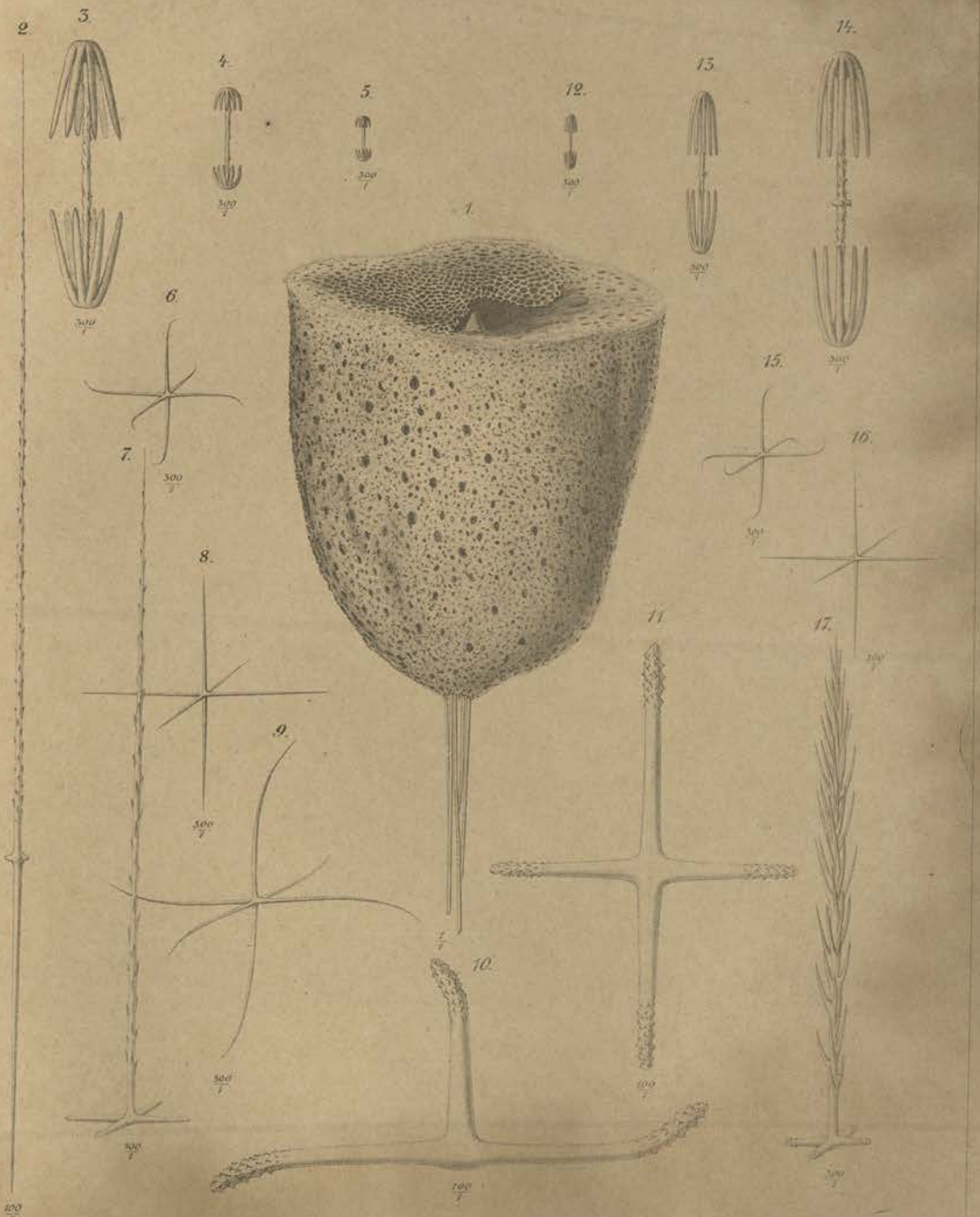

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Fig. 1–11. HYALONEMA DIVERGENS. F.E. Schulze. Fig. 12–17. HYALONEMA LUSITANICUM. Bocage.

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Hyalonema toxeres, Wyville Thomson. 201

Fig. 1. Conical specimen, preserved in alcohol, without the basal tuft; natural size.

Fig. 2. Inferior side view of a compressed damaged specimen, from a photograph; natural size.

Fig. 3. Superior (gastral) side view of the compressed damaged specimen shown in fig. 2, from a photograph; natural size.

Fig. 4. A little specimen, preserved in alcohol, with some *Palythoa* investment of the basal tuft; natural size.

Fig. 5. Vertical section through the marginal portion of the specimen shown in figs. 2 and 3 (combination figure); × 20.

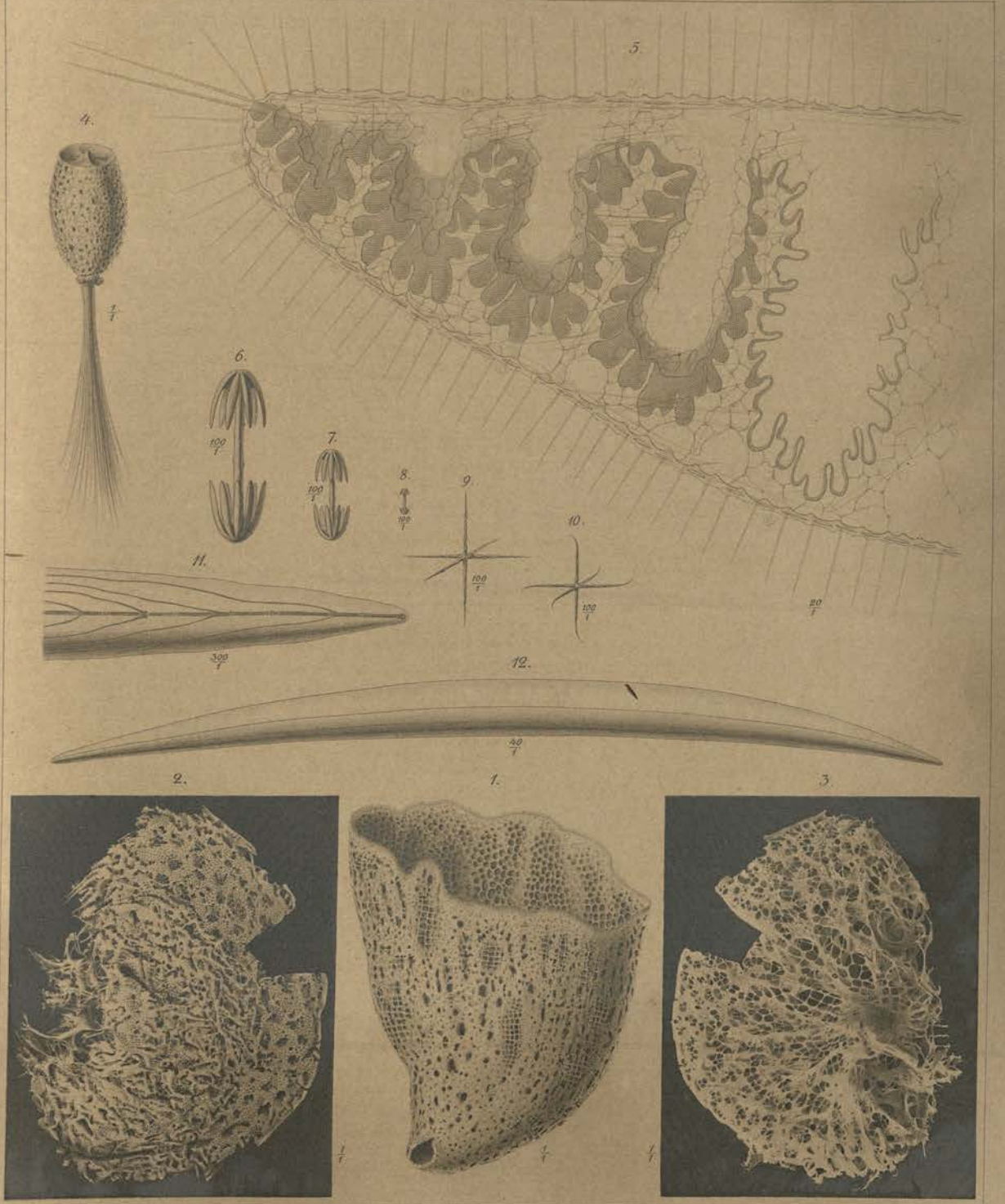
Figs. 6–8. Amphidiscs of various sizes; × 100.

Fig. 9. Oxyhexact with straight barbed rays; × 100.

Fig. 10. Oxyhexact with bent barbed rays; × 100.

Fig. 11. Extremity of a strong bow-like bent principal diact; × 300.

Fig. 12. Strong bow-like bent principal diact; × 40



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HYALONEMA TOXERES. Wyville Thomson.

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Figs. 1–8. *Hyalonema tenue*, F. E. S., . . . 228

Fig. 1. Fragment, showing the margin of the oscular aperture, outer side view; natural size.

Fig. 2. Fragment of the side wall, interior (gastral) side view; natural size.

Fig. 3. Autodermal pentact pinulus; × 100.

Fig. 4. Amphidisc; × 300.

Fig. 5. Oxyhexact with smooth bent rays; × 300.

Fig. 6. Amphidisc; × 300.

Fig. 7. Marginal diact with four cruciately disposed central knobs; × 100.

Fig. 8. Oxyhexact with straight smooth rays; × 300.

Figs. 9–17. *Hyalonema kentii*, O. Schmidt, . . 207

Fig. 9. Dried specimen without basal tuft, from a photograph; natural size.

Fig. 10. Great amphidisc from the dermal membrane; × 100.

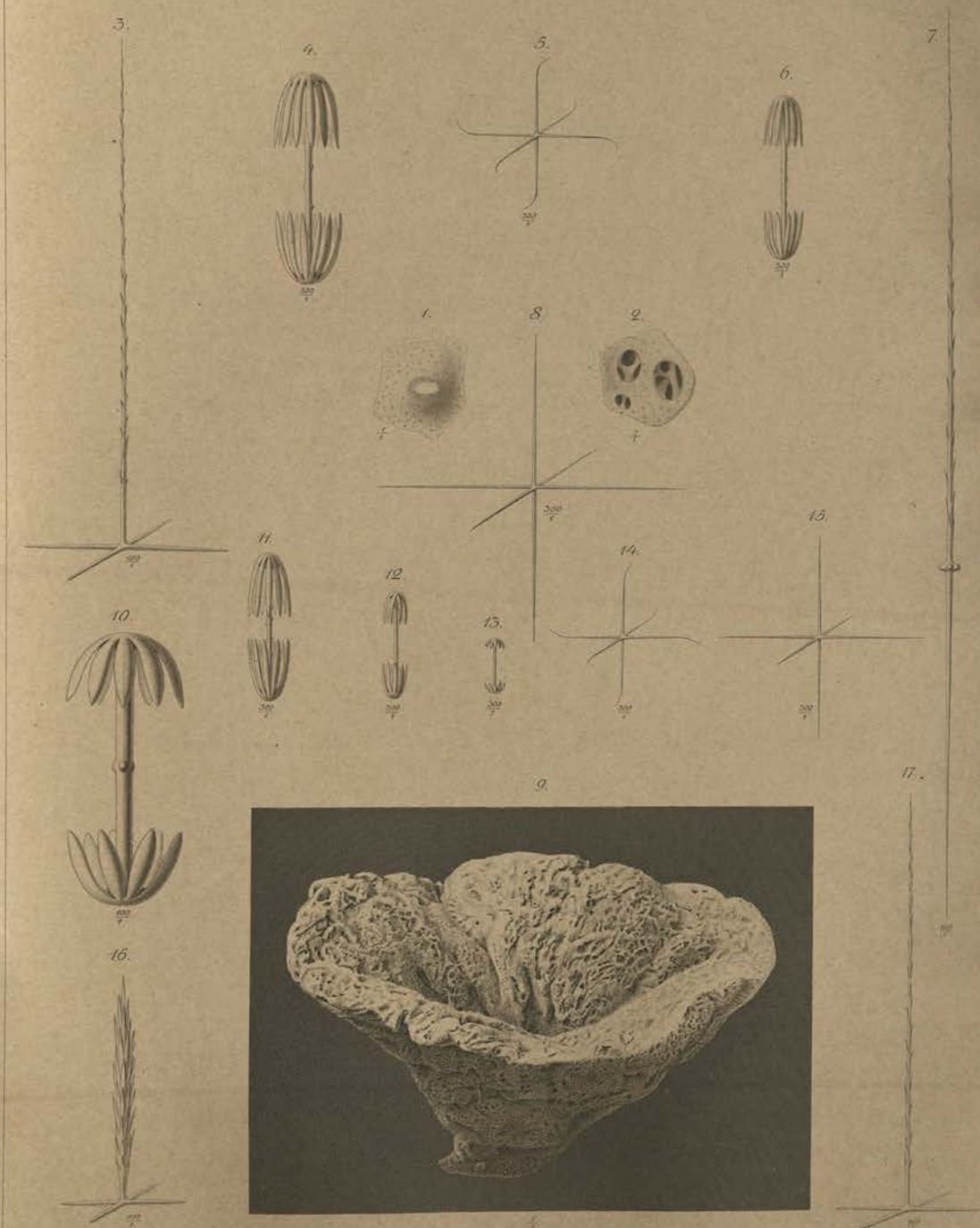
Figs. 11–13. Amphidiscs of various sizes; × 300.

Fig. 14. Oxyhexact with smooth bent rays; × 300.

Fig. 15. Oxyhexact with smooth straight rays; × 300.

Fig. 16. Autodermal pentact pinulus of the lateral side; × 100.

Fig. 17. Autodermal pentact pinulus of the sieve plate; × 100.



F.E. Schulze and O. Firtsch del.

Fig. 1-8. HYALONEMA TENUE. F.E. Schulze. Fig. 9-17. HYALONEMA KENTII Oscar Schmidt.

PLATE XXXI.

PLATE XXXI.

PAGE

Figs. 1–7. *Hyalonema* (*Stylocalyx*) *elegans*, F. E. S., . . 223

Fig. 1. A somewhat damaged specimen, preserved in alcohol; natural size.

Fig. 2. Fragment of the outer part, outer side view; × 60.

Fig. 3. Diact with two central knobs and echinated ends; × 100.

Fig. 4. Autodermal pentact pinulus; × 200.

Fig. 5. Small amphidisc; × 500.

Fig. 6. Middle-sized amphidisc with echinated axial beam; × 200.

Fig. 7. Small amphidisc with nodular axial beam; × 500.

Figs. 8–20. *Hyalonema* (*Stylocalyx*) *tenerum*, F. E. S., . . 224

Fig. 8. A damaged specimen, preserved in alcohol; natural size.

Fig. 9. Oxyhexact with smooth bent rays; × 300.

Fig. 10. Monact with one thickened echinated end; × 100.

Fig. 11. Autodermal pentact pinulus; × 200.

Fig. 12. Great globular amphidisc with ten rays; × 200.

Fig. 13. Great globular amphidisc, not yet full developed; × 200.

Fig. 14. Middle-sized amphidisc, terminally truncated, with straight rays; × 200.

Fig. 15. Tetract with echinated ends from the basal pad of the body; × 100.

Fig. 16. Small amphidisc; × 500.

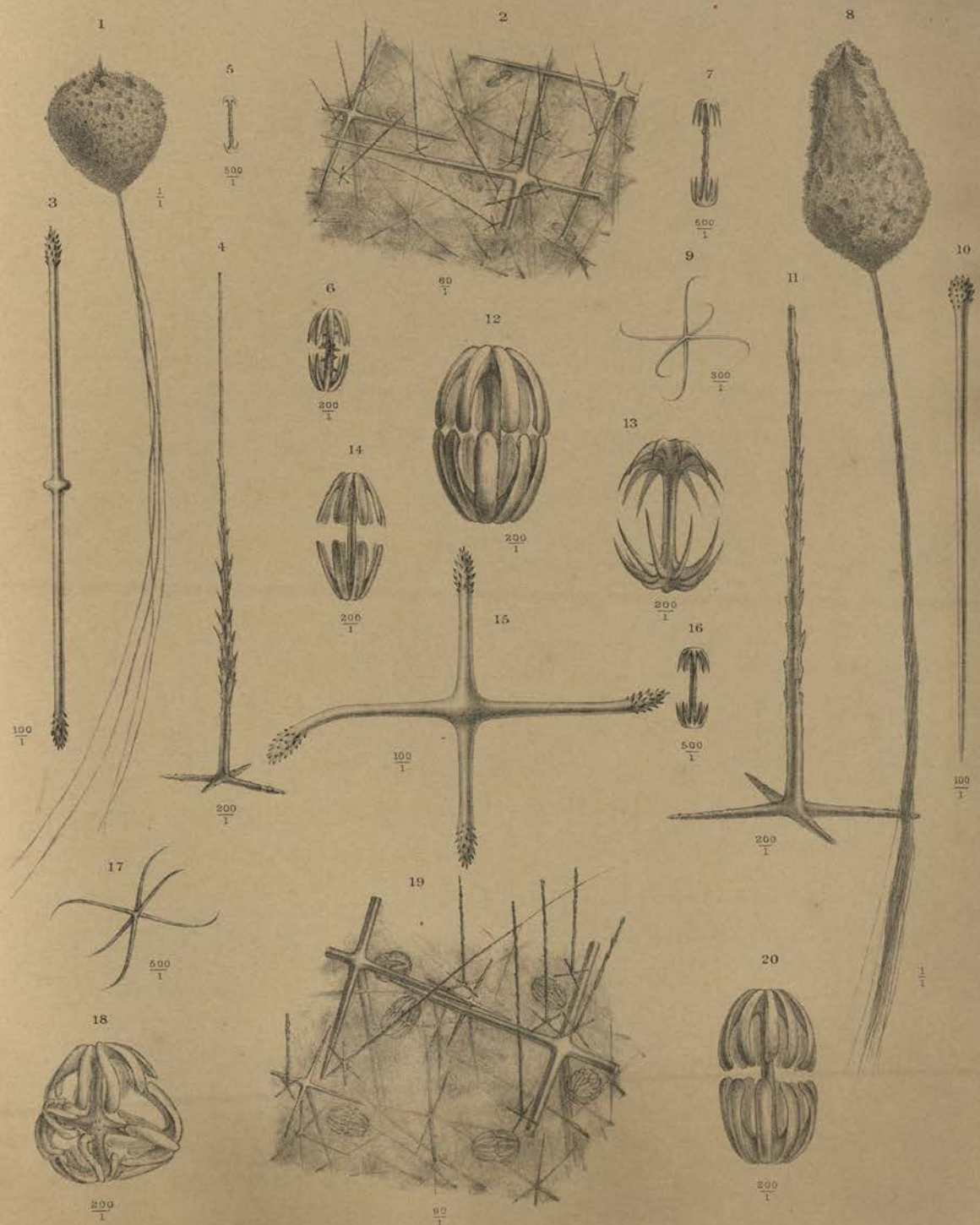
Fig. 17. Oxyhexact with smooth bent rays; × 500.

Fig. 18. Abnormally large globular "amphidisc" with four rays; × 200.

Fig. 19. Fragment of the outer portion, outer side view; × 60.

Fig. 20. Great amphidisc; × 200.

In the Plate the designation of figs. 8–20, *Hyalonema* (*Stylocalyx*) *tenerum*, F. E. S., has been accidentally omitted. This plate was arranged by Sir Wyville Thomson.



Gen. West lith. ad nat.

F. Huth, Lith.r Edin.r

HYALONEMA ELEGANS, F.E. Schulze

PLATE XXXII.

PLATE XXXII.

PAGE

Figs. 1–10. *Hyalonema robustum*, F. E. S., . . 229

Fig. 1. Lateral view of a great amphidisc; × 300.

Fig. 2. Terminal view of the same great amphidisc shown in fig. 1; × 300.

Figs. 3, 4. Middle-sized amphidiscs; × 300.

Fig. 5. Small amphidisc; × 300.

Fig. 6. Oxyhexact with smooth bent rays; × 300.

Fig. 7. Autodermal pentact pinulus; × 300.

Fig. 8. Oxyhexact with straight echinated rays; × 300.

Fig. 9. Strong tetract with echinated ends from the basal pad; × 300.

Fig. 10. Strong diact with echinated ends and two central echinated knobs; × 300.

Figs. 11–16. *Hyalonema* sp., near *Hyalonema* (*Stylocalyx*) *depressum*, F. E. S., 231

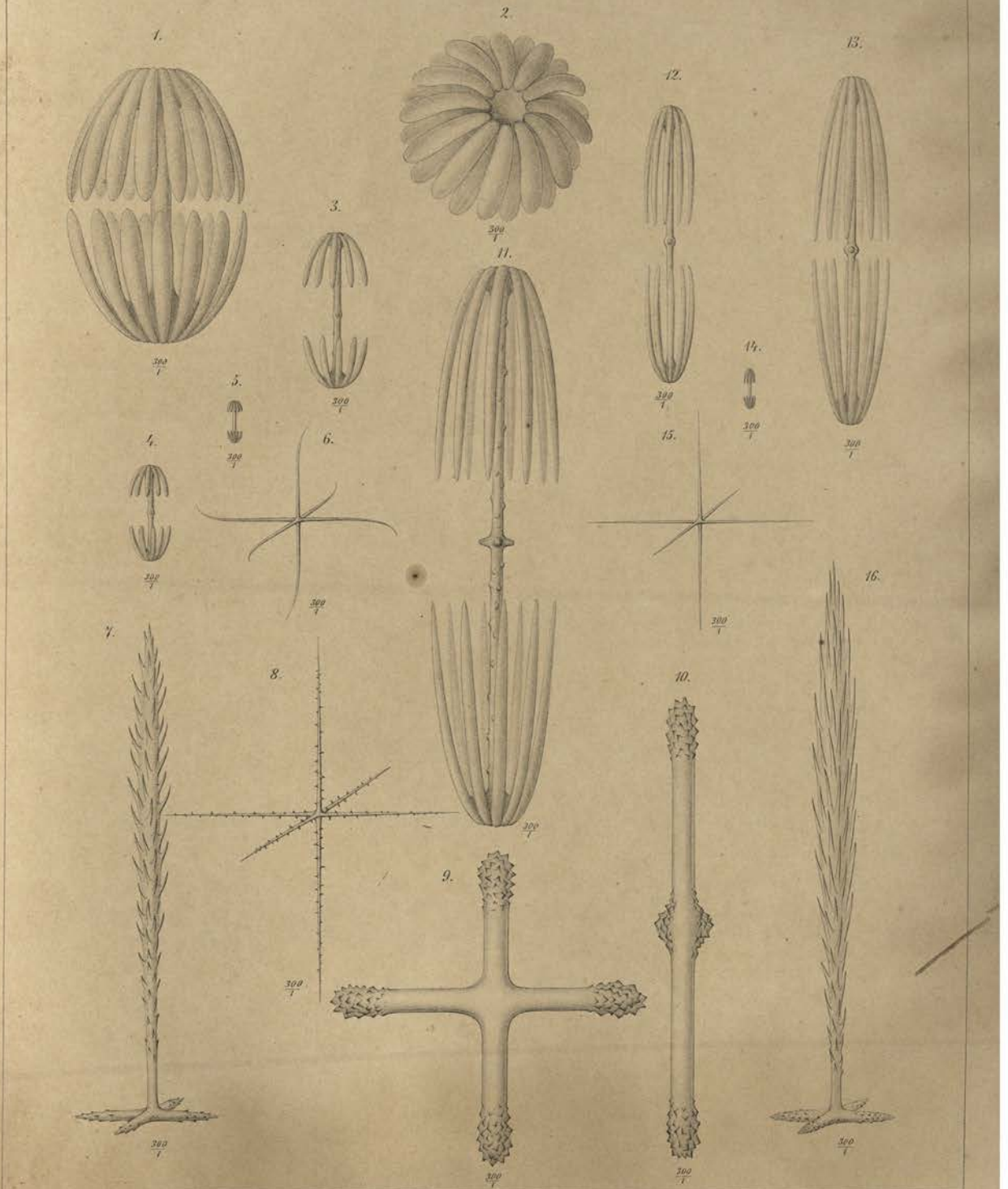
Fig. 11. Great slender amphidisc with four cruciately disposed central knobs on the axial beam; × 300.

Figs. 12, 13. Middle-sized slender amphidiscs; × 300.

Fig. 14. Small amphidisc; × 300.

Fig. 15. Oxyhexact with straight smooth rays; × 300.

Fig. 16. Autodermal pentact pinulus; × 300.



F.E. Schulze and S. Pitsch del.

Fig. 1-10. HYALONEMA ROBUSTUM. F.E. Schulze. Fig. 11-16. HYALONEMA SP.

PLATE XXXIII.

PLATE XXXIII.

PAGE

Figs. 1–7. *Hyalonema poculum*, F. E. S., . . 208

Fig. 1. A specimen, much damaged at the lower part, preserved in alcohol; natural size.

Fig. 2. Vertical section of the marginal portion of the specimen shown in fig. 1 (combination figure); × 25.

Fig. 3. Marginal diact with four cruciately disposed pointed central knobs; × 300.

Fig. 4. Great amphidisc with four cruciately disposed central knobs on the axial beam; × 100.

Fig. 5. Small amphidisc; × 300.

Fig. 6. Autodermal pentact pinulus; × 300.

Fig. 7. Oxyhexact with straight rough rays; × 300.

Figs. 8–15. *Hyalonema conus*, F. E. S., . . . 209

Fig. 8. A specimen without the basal tuft, preserved in alcohol; natural size.

Fig. 9. Great amphidisc with four cruciately disposed central knobs at the axial beam; × 300.

Fig. 10. Inferior part of an anchor-like spicule of the basal tuft; × 100.

Figs. 11, 12. Middle-sized amphidiscs; × 300.

Fig. 13. Small amphidisc; × 300.

Fig. 14. Autodermal pentact pinulus, from the sieve-plate; × 100.

Fig. 15. Autodermal pentact pinulus, from the lateral side; × 100.

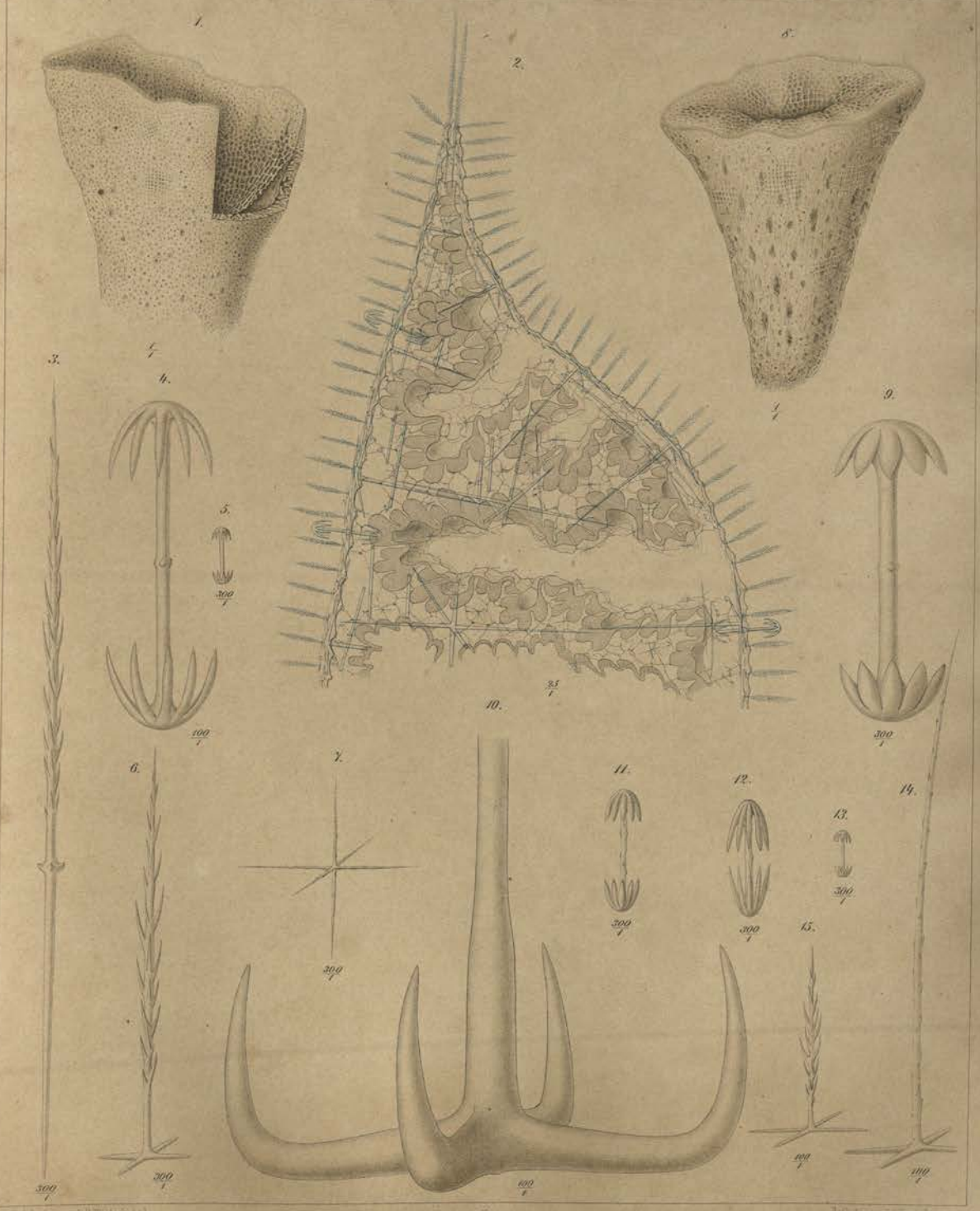


Fig 1-7. HYALONEMA POCULUM F.E.Schulze. — Fig. 8-15. HYALONEMA CONUS F.E.Schulze.

PLATE XXXIV.

PLATE XXXIV.

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Figs. 1–11. *Hyalonema* (*Stylocalyx*) *thomsoni*, W. Marshall, . 211

Fig. 1. A specimen, preserved in alcohol; natural size.

Fig. 2. Great amphidisc with four cruciately disposed central knobs; × 300.

Fig. 3. Middle-sized amphidisc with a central thickening of the axial beam; × 300.

Fig. 4. Oxyhexact with straight rough rays; × 300.

Fig. 5. Small amphidisc; × 300.

Fig. 6. Autodermal pentact pinulus; × 300.

Fig. 7. Undeveloped great amphidisc; × 300.

Fig. 8. Middle-sized amphidisc; × 300.

Fig. 9. Inferior part of an anchor-like spicule of the basal tuft; × 100.

Fig. 10. Strong hexact from the basal pad, with echinated ends; × 300.

Fig. 11. Strong tetract from the basal pad, with rough rays and echinated ends; × 300.

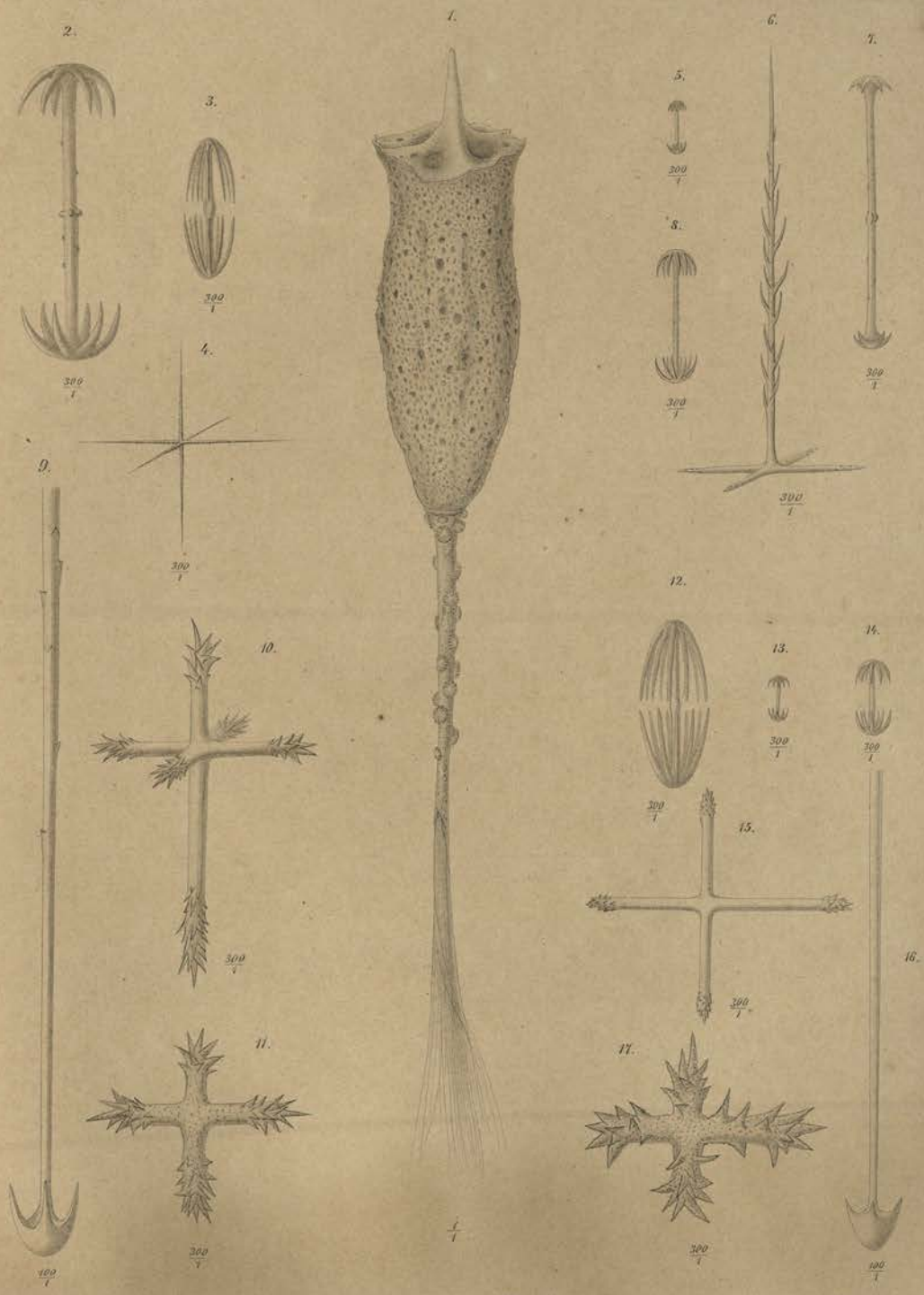
Figs. 12–17. *Hyalonema* (*Stylocalyx*) *thomsoni*, var. *exigua*, . 214

Figs. 12–14. Amphidiscs of various sizes; × 300.

Fig. 15. Tetract with echinated ends, from the basal pad; × 300.

Fig. 16. Inferior part of an anchor-like spicule of the basal tuft; × 100.

Fig. 17. Strong tetract with rough rays and echinated ends from the basal pad; × 300.



F.E. Schulze and G. Fritsch del. lith. Anst. v. J.G. Bach, Leipzig.

FIG. 1–11. HYALONEMA THOMSONI. W. Marshall. — FIG. 12–17. var.: EXIGUUM. F.E. Schulze.

PLATE XXXV.

PLATE XXXV.

PAGE

Hyalonema (*Stylocalyx*) *depressum*, F. E. S., . . . 217

Fig. 1. A specimen, preserved in alcohol; natural size.

Fig. 2. Longitudinal section through the body and the basal tuft; natural size.

Fig. 3. Fragment of the outer part; × 60.

Fig. 4. Great amphidisc; × 200.

Figs. 5, 6. Autogastral pentact pinuli; × 300.

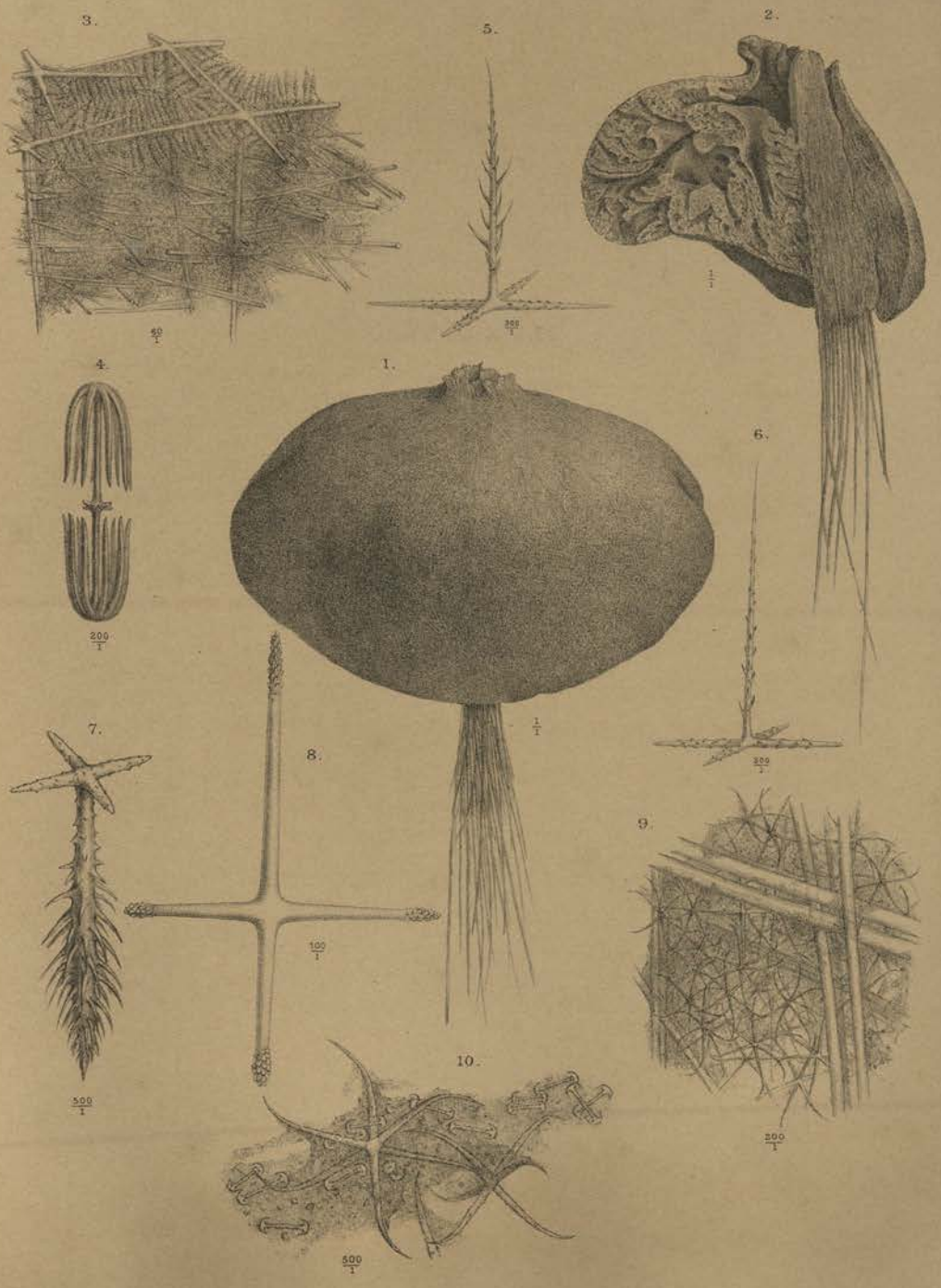
Fig. 7. Autodermal pentact pinulus; × 500.

Fig. 8. Tetract with echinated ends from the basal annular pad of the body; × 100.

Fig. 9. Fragment of the parenchyma, with different parenchymal spicules; × 200.

Fig. 10. Fragment of the parenchyma, with oxyhexacts and small amphidiscs; × 500.

This plate was arranged by Sir Wyville Thomson.



Geo. West lith. ad nat.

F. Huth, Lith.ʳ Edin.ʳ

HYALONEMA DEPRESSUM, F.E. Schulze.

PLATE XXXVI.

PLATE XXXVI.

PAGE

Hyalonema depressum, F. E. S., ... 217

Fig. 1. Vertical section of the lateral wall; × 12.

Fig. 2. Parenchymal monact; × 100.

Fig. 3. Great amphidisc with bent central prongs; × 300.

Figs. 4, 5. Middle-sized amphidiscs; × 300 and 450.

Fig. 6. Small amphidiscs; × 450.

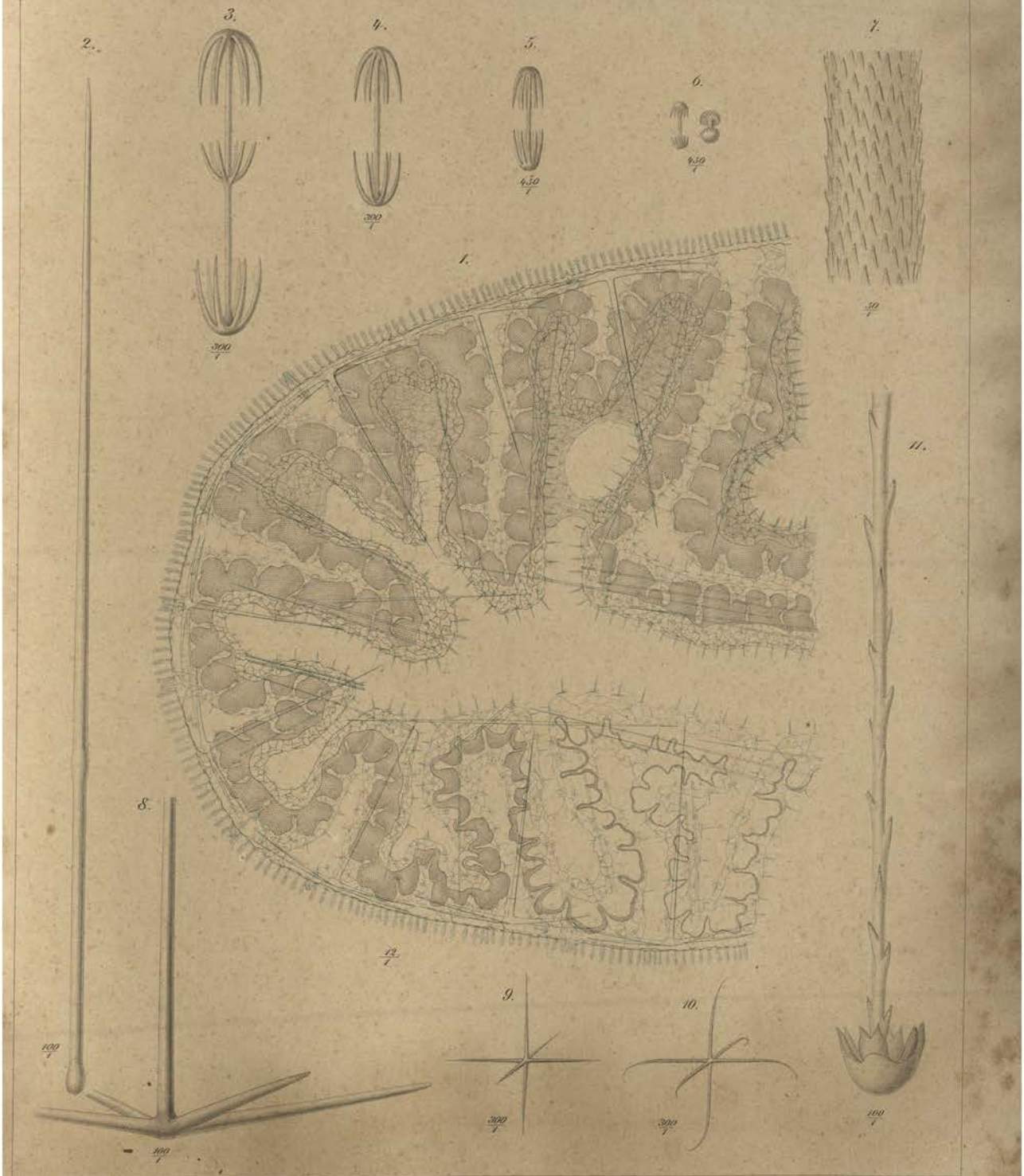
Fig. 7. Middle part of a long spicule of the basal tuft; × 50.

Fig. 8. Part of a hypodermal pentact; × 100.

Fig. 9. Oxyhexact with straight barbed rays; × 300.

Fig. 10. Oxyhexact with bent barbed rays; × 300.

Fig. 11. Inferior end of an anchor-like spicule of the basal tuft; × 100.



F.E. Schulze and S. Pertsch del.

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HYALONEMA DEPRESSUM F.E. Schulze.

PLATE XXXVII.

PLATE XXXVII.

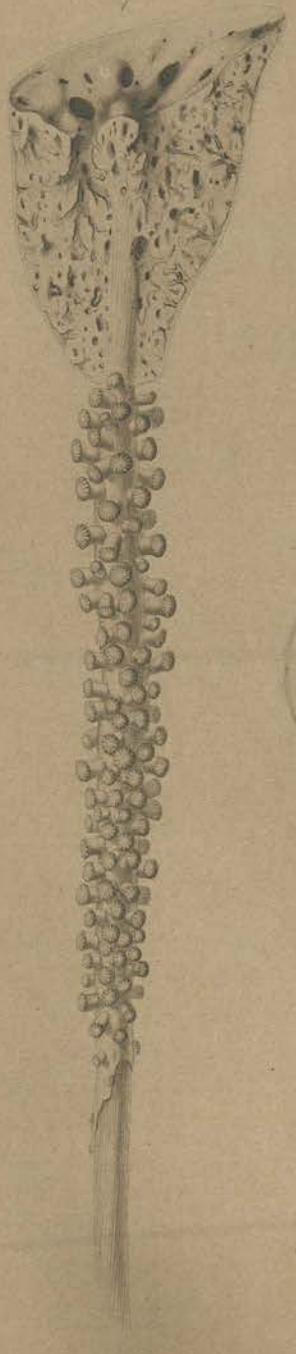
PAGE

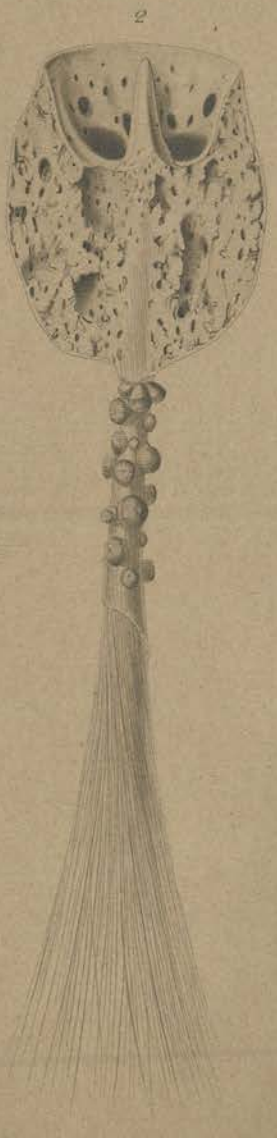
Hyalonema (*Stylocalyx*) *apertum*, F. E. S., . . . 214

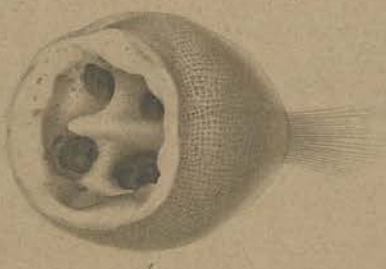
Fig. 1. Longitudinal section of a specimen, preserved in alcohol; basal tuft invested with a large colony of *Palythoa*; natural size.

Fig. 2. Longitudinal section of a specimen, preserved in alcohol; basal tuft invested with a smaller colony of *Palythoa*; natural size.

Fig. 3. Intact specimen, preserved in alcohol, view from the upper side; natural size.







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HYALONEMA APERTUM. F.E. Schulze.

PLATE XXXVIII.

PLATE XXXVIII.

PAGE

Hyalonema (*Stylocalyx*) *apertum*, F. E. S., . . 214

Fig. 1. Vertical section through the upper marginal portion (combination figure); × 20.

Fig. 2. External view of the dermal membrane; × 60.

Fig. 3. Oxydiact from the parenchyma; × 100.

Fig. 4. Small strong oxyhexact with straight echinated rays; × 300.

Fig. 5. Oxyhexact with bent barbed rays × 300.

Fig. 6. Middle-sized amphidisc; × 300.

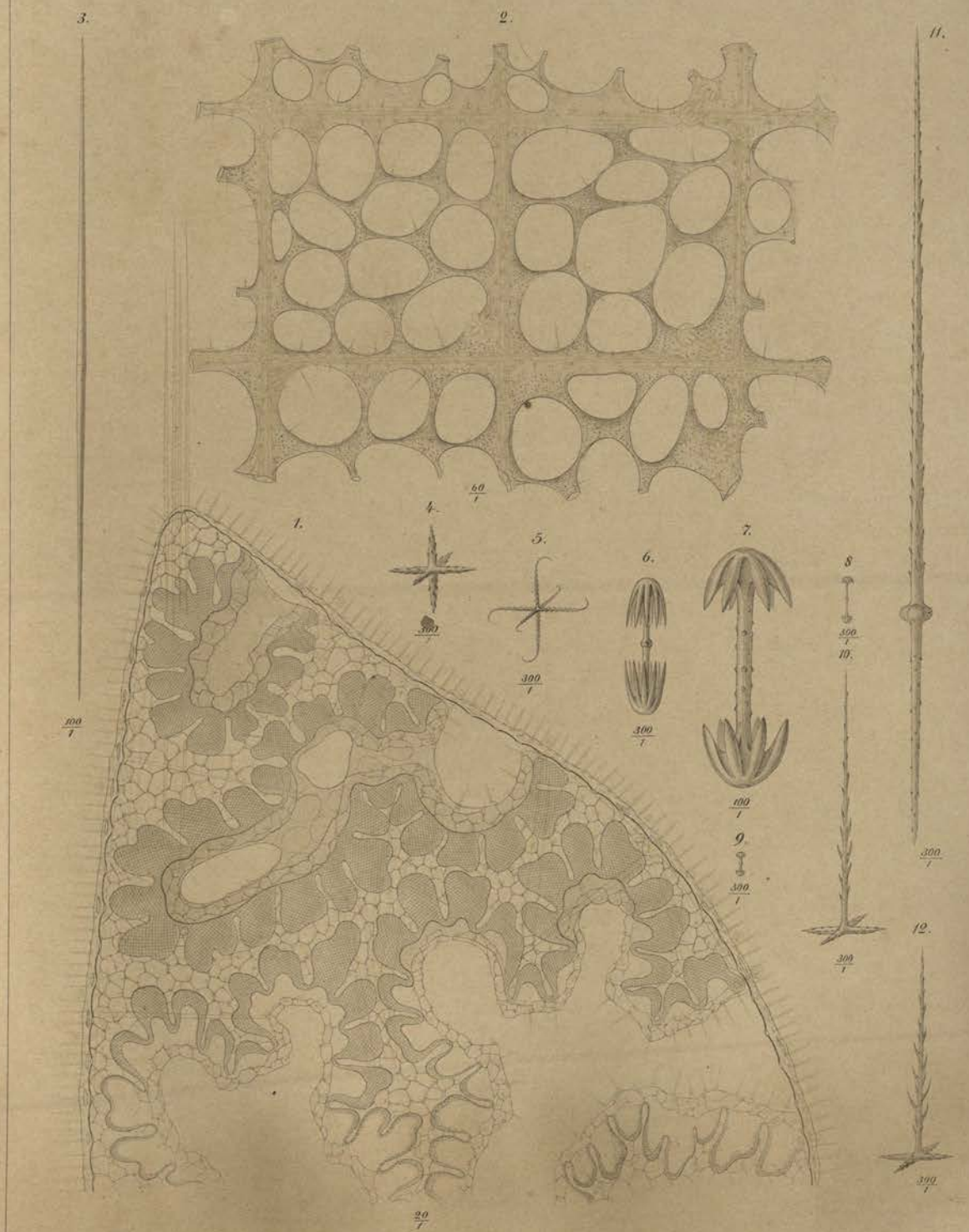
Fig. 7. Great amphidisc with nodose axial beam; × 100.

Figs. 8, 9. Small amphidiscs; × 300.

Fig. 10. Autodermal pentact pinulus; × 300.

Fig. 11. Marginal oxydiact with four cruciately disposed central knobs; × 300.

Fig. 12. Gastral pentact pinulus; × 300.



F.E.Schulze and G.Fritsch del.

Lith. Anst. v. J.G.Bach, Leipzig.

HYALONEMA APERTUM. F.E.Schulze.

PLATE XXXIX.

PLATE XXXIX.

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Figs. 1–9. *Hyalonema* sp., . . . 232

Fig. 1. Marginal oxydiact with four cruciately disposed knobs; × 300.

Figs. 2, 3. Great amphidiscs with spinous axial beam; × 300.

Fig. 4. Middle-sized amphidisc; × 300.

Fig. 5. Autodermal pentact pinulus; × 300.

Fig. 6. Oxyhexact with straight smooth rays; × 300.

Fig. 7. Autodermal pentact pinulus; × 300.

Fig. 8. Small amphidisc; × 300.

Fig. 9. Middle-sized amphidisc; × 300.

Figs. 10–15. *Hyalonema* sp., near *Hyalonema conus*, F. E. S., . 233

Fig. 10. Great amphidisc with broad paddle-shaped umbel rays; × 300.

Fig. 11. Middle-sized amphidisc; × 300.

Fig. 12. Oxyhexact with straight smooth rays; × 300.

Fig. 13. Autodermal pentact pinulus; × 300.

Fig. 14. Small amphidisc; × 300.

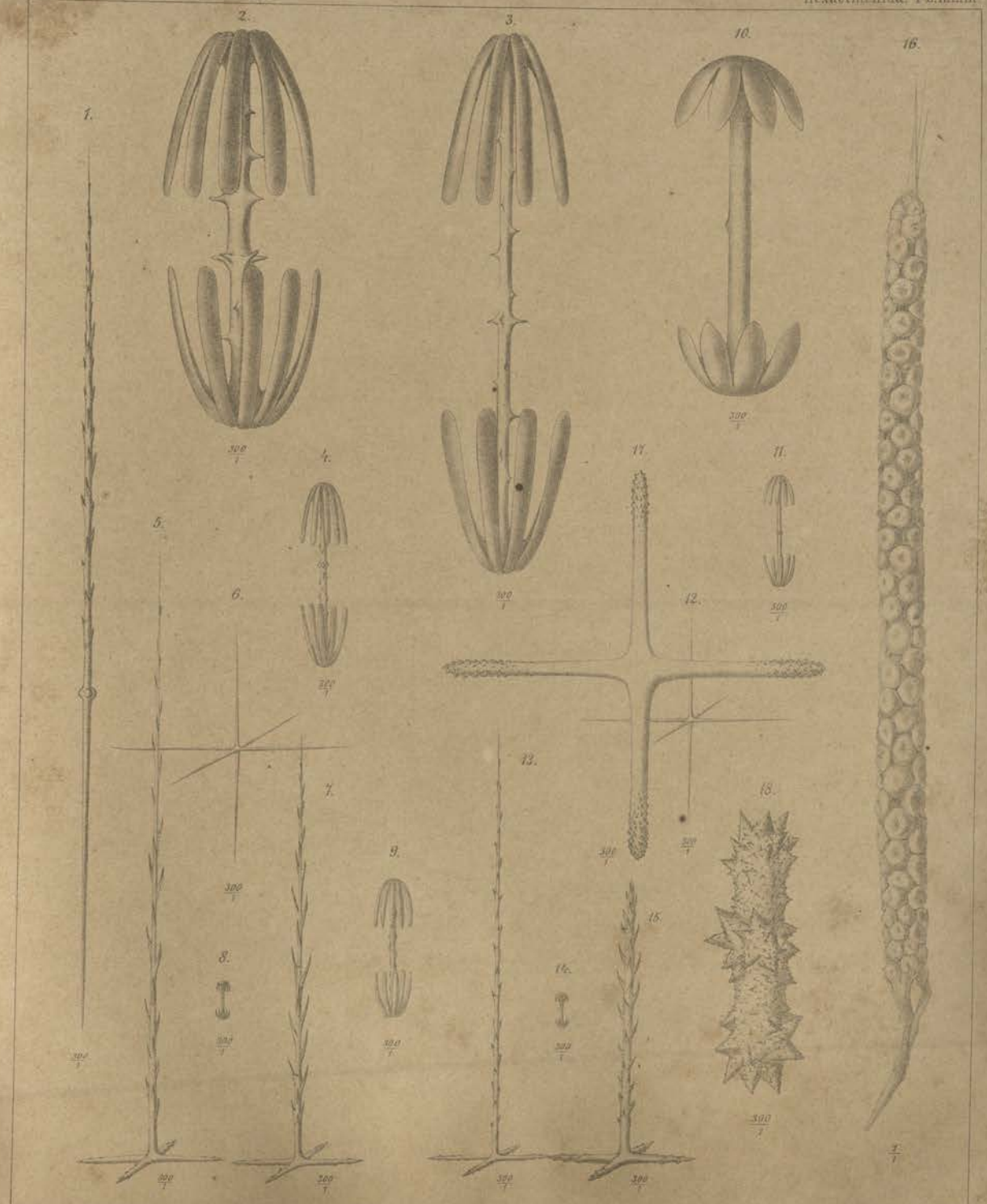
Fig. 15. Autodermal pentact pinulus; × 300.

Figs. 16–18. *Hyalonema* (probably) *lusitanicum*, Bocage, . 225

Fig. 16. Basal tuft with *Palythoa*-investment, torn from the body; natural size.

Fig. 17. Tetract with rough ends, from the basal pad-rest of the superior end of the tuft; × 300.

Fig. 18. Echinated and rough thick diact, from the basal pad-rest of the superior end of the tuft; × 300.



F.E. Schulze and G. Firtsch del.

Lith. Anst. v. J.G. Bach, Leipzig.

Fig. 1-9. HYALONEMA SP. Fig. 10-15. HYALONEMA SP. Fig. 16-18. HYALONEMA SP.

PLATE XL.

PLATE XL.

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Hyalonema (*Stylocalyx*) *globus*, F. E. S., . . . 221

Fig. 1. Specimen, preserved in alcohol, with damaged basal tuft; natural size.

Fig. 2. Fragment of the outer part, view of the outer side; × 60.

Fig. 3. Strand of parenchymal diacts; × 200.

Fig. 4. Parenchymal oxydiact with central knot; × 100.

Fig. 5. Oxydiact with terminal barbs and four central pointed knobs, cruciately disposed; × 200.

Fig. 6. Marginal oxydiact with four cruciately disposed central knobs; × 100.

Fig. 7. Large amphidisc; × 100.

Fig. 8. Inferior part of an anchor-like spicule of the basal tuft; × 100.

Fig. 9. Spicules of the basal tuft; × 100.

Fig. 10. Oxyhexact with straight smooth rays; × 500.

Figs. 11, 13. Oxyhexasters, which do not belong to *Hyalonema* (*Stylocalyx*) *globus*, but have intruded from some other form; × 500.

Fig. 12. Tetract with echinated ends, from the basal pad; × 100.

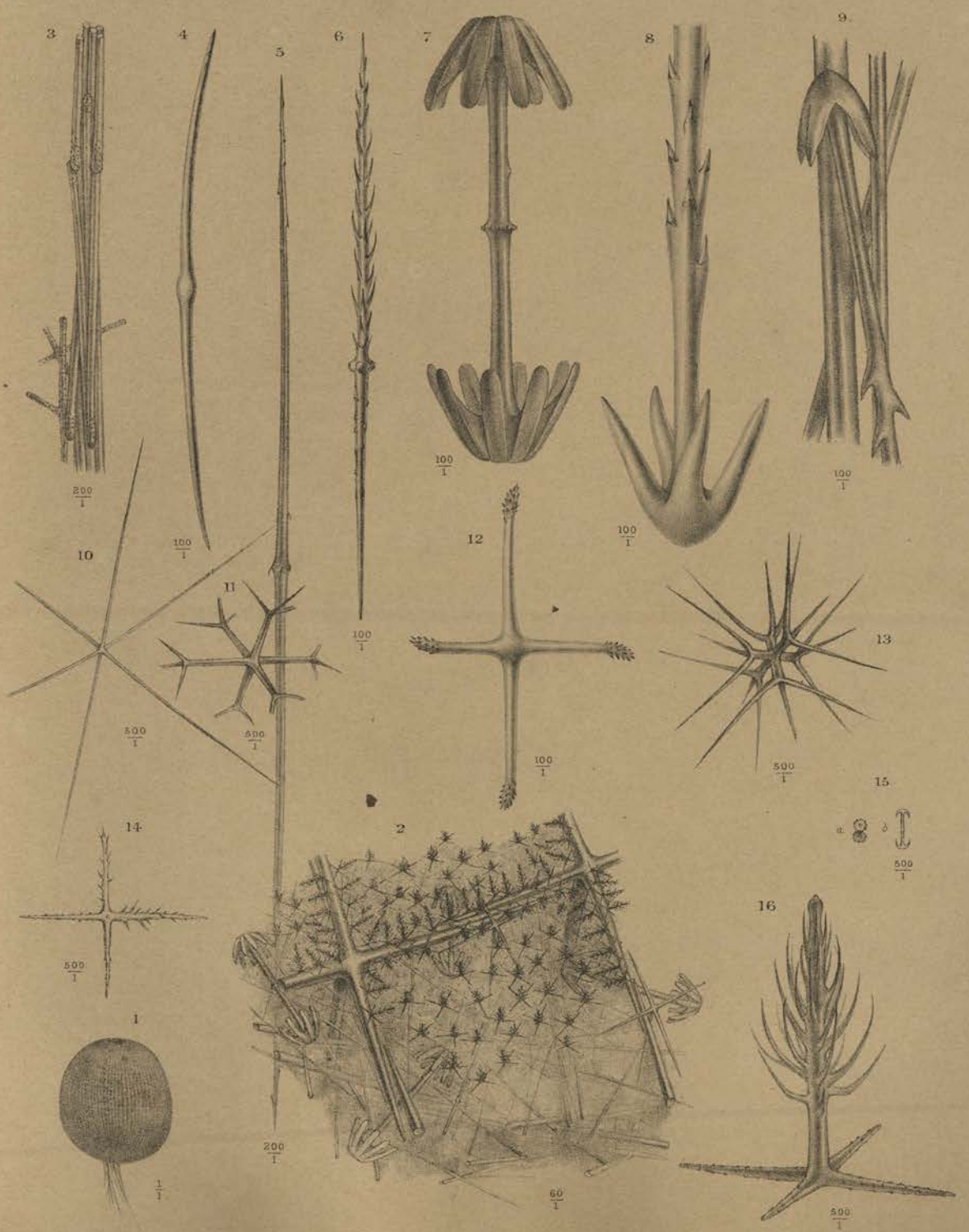
Fig. 14. Oxyhexact with echinated rays; × 500.

Fig. 15. Small amphidiscs; × 500.

Fig. 16. Autodermal pentact pinulus; × 500.

This plate was arranged by Sir Wyville Thomson.

For "*Dictyosphæra*" on the plate read "*Hyalonema* (*Stylocalyx*)."



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DICTYOSPHAERA GLOBUS, F.E. Schulze.

PLATE XLI.

PLATE XLI.

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Hyalonema (*Stylocalyx*) *clavigerum*, F. E. S., . . 220

Fig. 1. Fragment, preserved in alcohol; natural size.

Fig. 2. Vertical section of the marginal portion, with extrinsic, intruded oxyhexasters (combination figure); × 60.

Fig. 3. Marginal oxydiact with four cruciately disposed central knobs; × 300.

Fig. 4. Autodermal pentact pinulus; × 300.

Fig. 5. Intruded oxyhexaster, not belonging to *Hyalonema* (*Stylocalyx*) *clavigerum*; × 300.

Fig. 6. Oxydiact with terminal barbs; × 300.

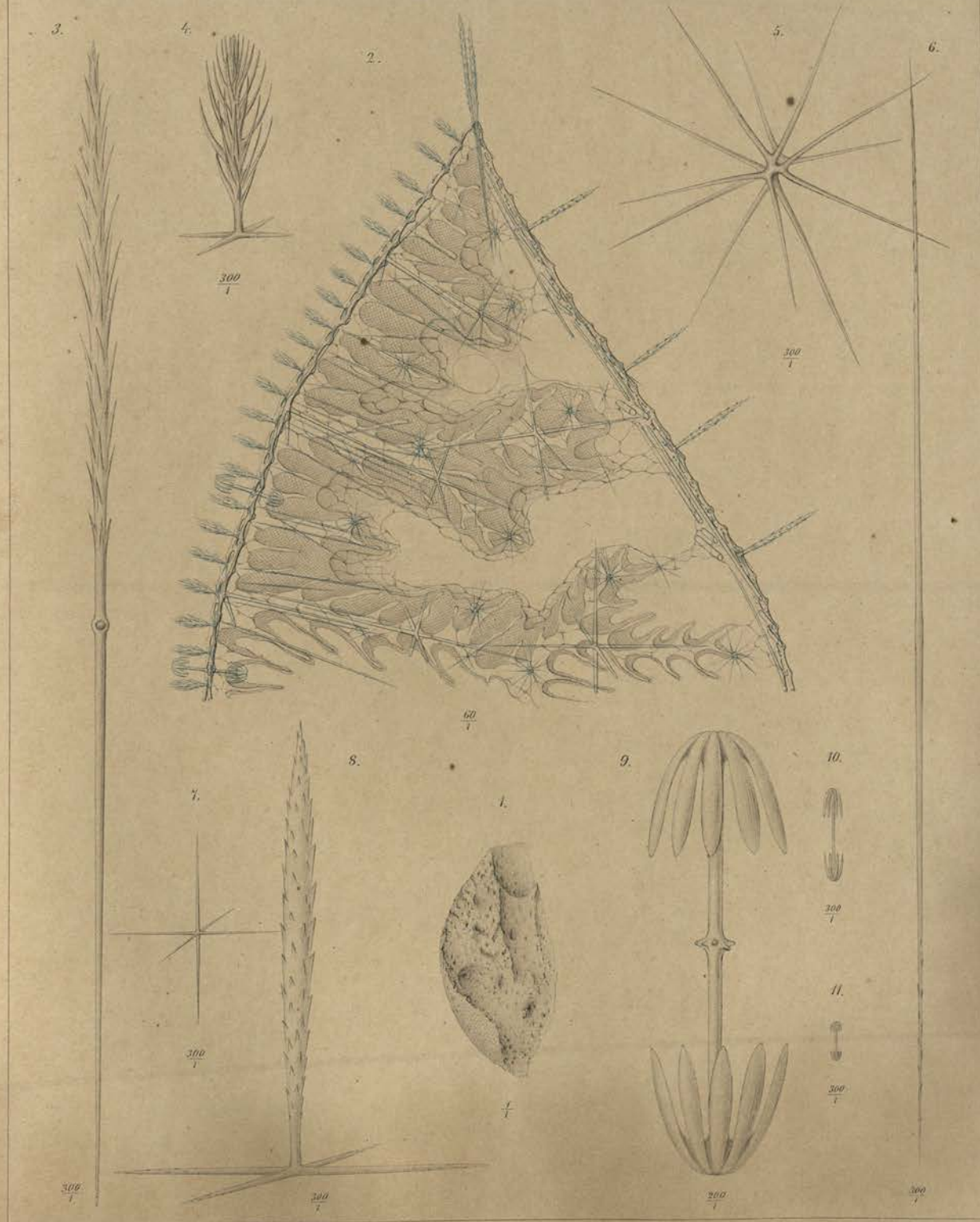
Fig. 7. Oxyhexact with straight smooth rays; × 300.

Fig. 8. Autogastral pentact pinulus; × 300.

Fig. 9. Large amphidisc; × 200.

Figs. 10, 11. Small amphidiscs; × 300.

For "*Dictyosphæra*" on the Plate read "*Hyalonema* (*Stylocalyx*)."



F.E. Schulze and G. Pritsch del.

Lith. Anst. v. J.B. Bach, Leipzig.

DICTYOSPHAERA CLAVIGERA. F.E. Schulze.

PLATE XLII.

PLATE XLII.

PAGE

Pheronema annæ, Leidy, ... 239

Fig. 1. Half of a dried specimen, divided longitudinally, inner view; natural size.

Fig. 2. Large amphidisc with knobbed axial beam; × 300.

Figs. 3, 4. Middle-sized amphidiscs; × 300.

Fig. 5. Small amphidisc; × 300.

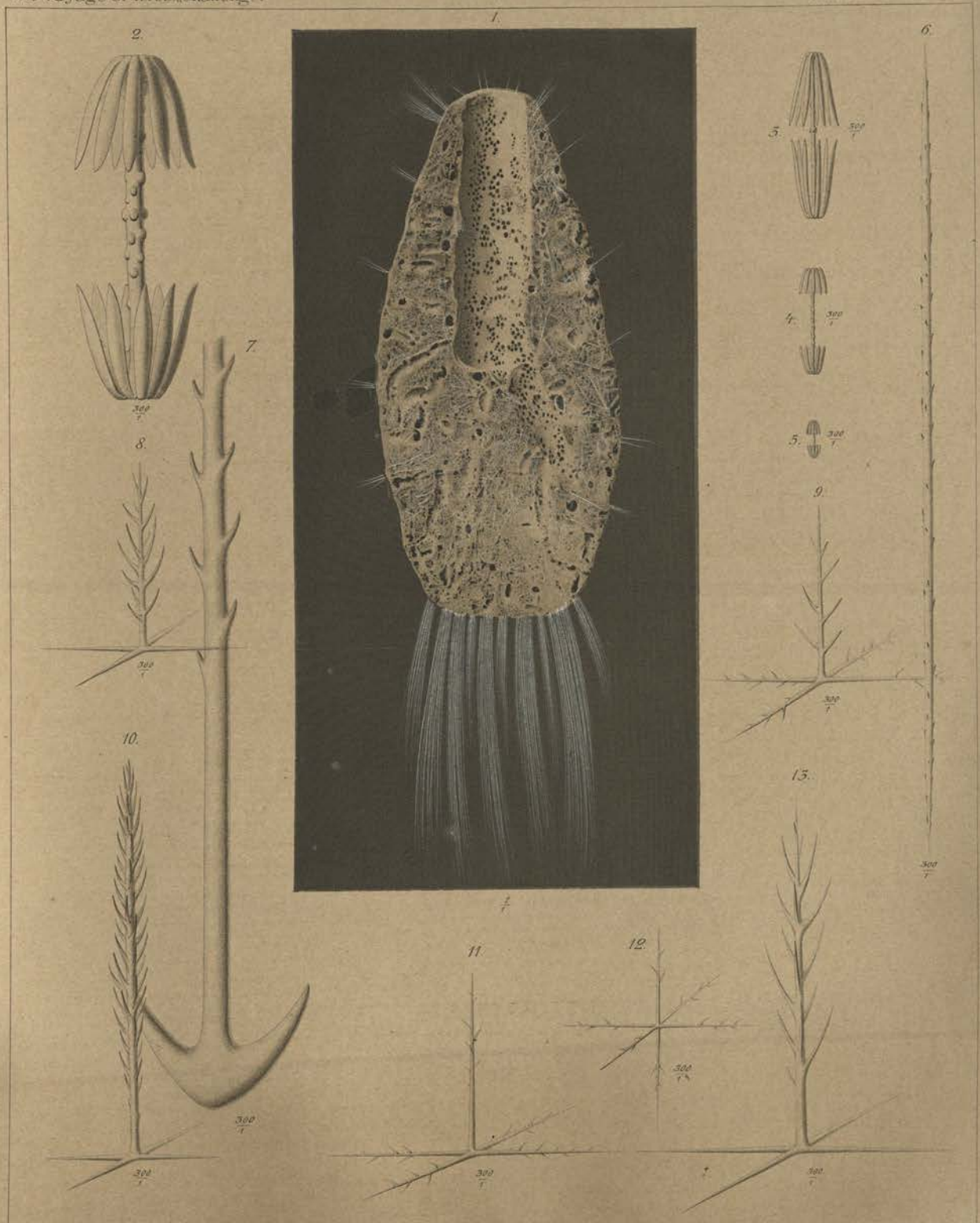
Fig. 6. Uncinatum-like oxydiact; × 300.

Fig. 7. Inferior part of an anchor-like spicule of the basal tuft; × 300.

Figs. 8, 9, 11, 13. Autocanalicular pentact pinuli; × 300.

Fig. 10. Autodermal pentact pinulus; × 300.

Fig. 12. Oxyhexact with echinated straight rays; × 300.



F. E. Schulze and G. Fritsch del.

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PHERONEMA ANNAE. J. Leidy.

PLATE XLIII.

PLATE XLIII.

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Pheronema carpenteri, Wyville Thomson, ... 241

Fig. 1. A dried specimen; × 0·5.

Fig. 2. Vertical section of the marginal portion of a specimen, preserved in alcohol (combination figure); × 50.

Fig. 3. Uncinatum-like oxydiact with barbs; × 300.

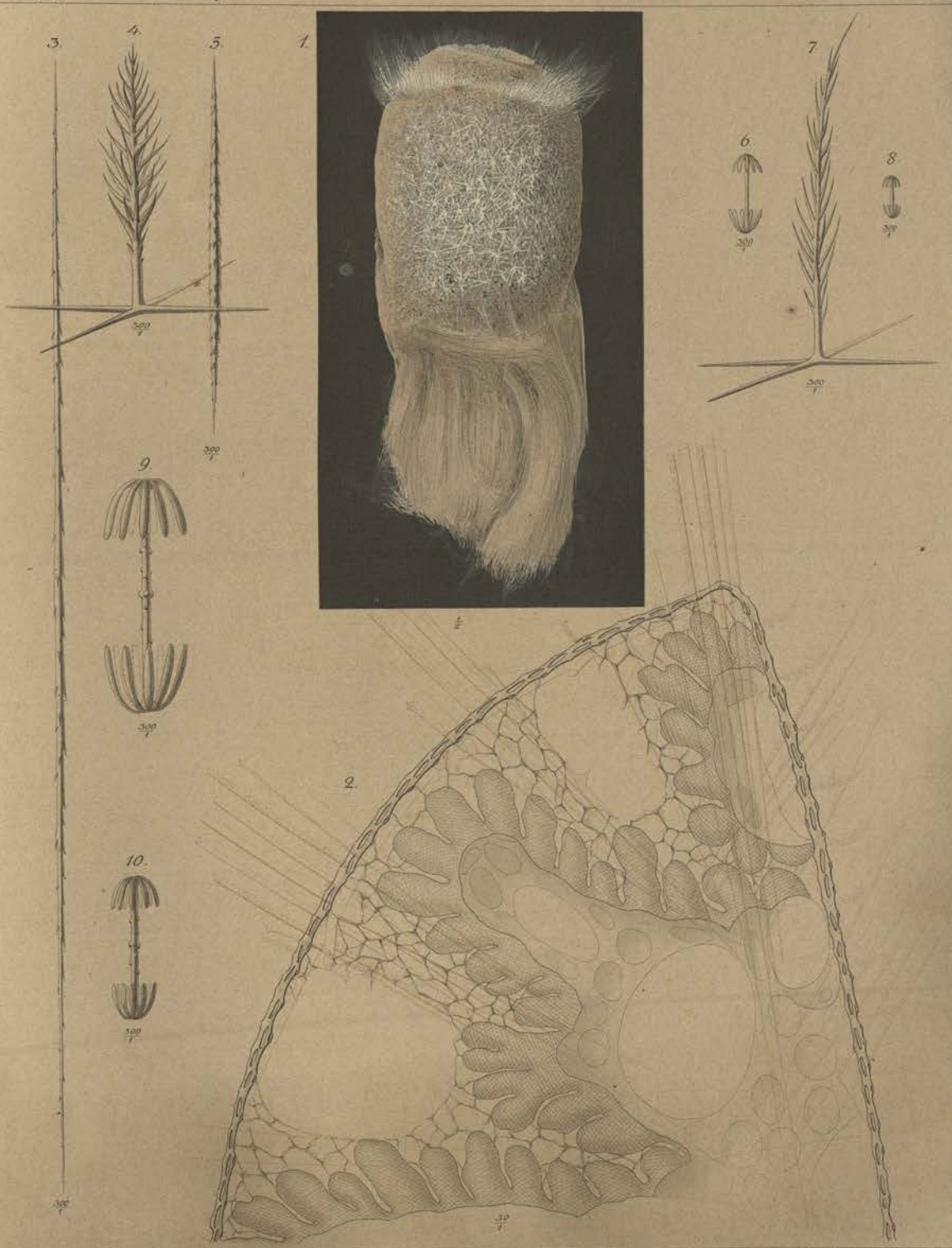
Fig. 4. Autodermal pentact pinulus; × 300.

Fig. 5. Small uncinatum-like oxydiact with barbs; × 300.

Figs. 6, 8, and 10. Middle-sized and small amphidiscs; × 300.

Fig. 7. Autogastral pentact pinulus; × 300.

Fig. 9. Large amphidisc; × 300.



PHERONEMA CARPENTERI. Wyville Thomson.

PLATE XLIV.

PLATE XLIV.

PAGE

Pheronema globosum, F. E. S., ... 248

Fig. 1. A specimen, preserved in alcohol, from a photograph ; natural size.

Fig. 2. Part cut out of the lateral wall ; natural size.

Fig. 3. Vertical section of the outer lateral part (combination figure); × 100.

Figs. 4, 7. Uncinatum-like oxydiacts ; × 50.

Fig. 5. Autodermal pentact pinulus ; × 300.

Fig. 6. Large amphidisc ; × 300.

Figs. 8, 9. Hypodermal oxypentacts ; natural size.

Fig. 10. Uncinatum-like oxydiact with curved barbs ; × 300.

Fig. 11. Anchors of the basal tuft ; natural size.

Figs. 12, 13. Small amphidiscs ; × 300.

For "*hemisphæricum*, Th. Higgin," on the Plate, read "*globosum*, F. E. S."

F.E. Schulze and G. Furstd. del.

Lith. Anst. v. Werner & Winter, Frankfurt a/M.

PHERONEMA HEMISPHAERICUM. Th. Higgin.

PLATE XLV.

PLATE XLV.

PAGE

Pheronema giganteum, F. E. S., ... 250

Fig. 1. A specimen, preserved in alcohol; × 0·5.

Fig. 2. Large autodermal pentact pinulus; × 200.

Fig. 3. Small autodermal pentact pinulus; × 200.

Fig. 4. Small autocanalicular pentact pinulus; × 200.

Fig. 5. Large autogastral pentact pinulus; × 200.

Fig. 6. Uncinatum-like oxydiact; × 100.

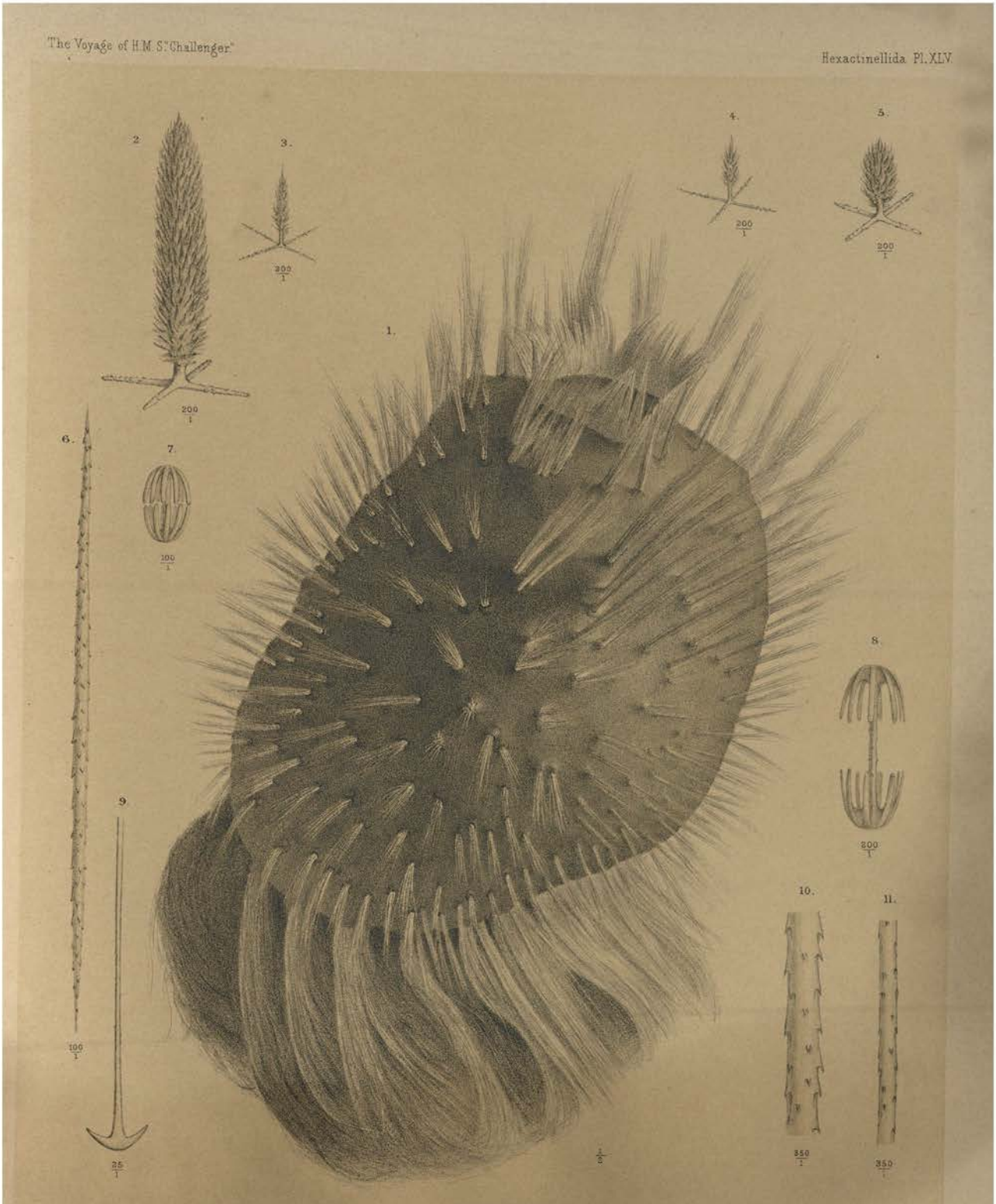
Fig. 7. Large amphidisc; × 100.

Fig. 8. Large amphidisc; × 200.

Fig. 9. Inferior part of an anchor-like spicule of the basal tuft; × 25.

Figs. 10, 11. Middle part of uncinatum-like oxydiacts, from the outer wall; × 350.

This plate was arranged by Sir Wyville Thomson.



Geo. West. lith. ad nat.

F. Huth, Lith. Edin.

PHERONEMA GIGANTEUM, F.E. Schulze.

PLATE XLVI.

PLATE XLVI.

PAGE

Pheronema giganteum, F. E. S., ... 250

Fig. 1. Half of a longitudinally divided specimen, preserved in alcohol; internal view; × 0·333.

Fig. 2. Marginal portion, longitudinal section; natural size.

Fig. 3. Portion of the outside, the light showing through it; natural size.

Fig. 4. Inner surface of gastral cavity; natural size.

Fig. 5. Small amphidisc; × 500.

Fig. 6. Portion of the inner surface of a large passage with large and small autocanalicular pentact pinuli; × 200.

Fig. 7. Section of the wall, with a part of the dermal and canalicular surface; × 60.

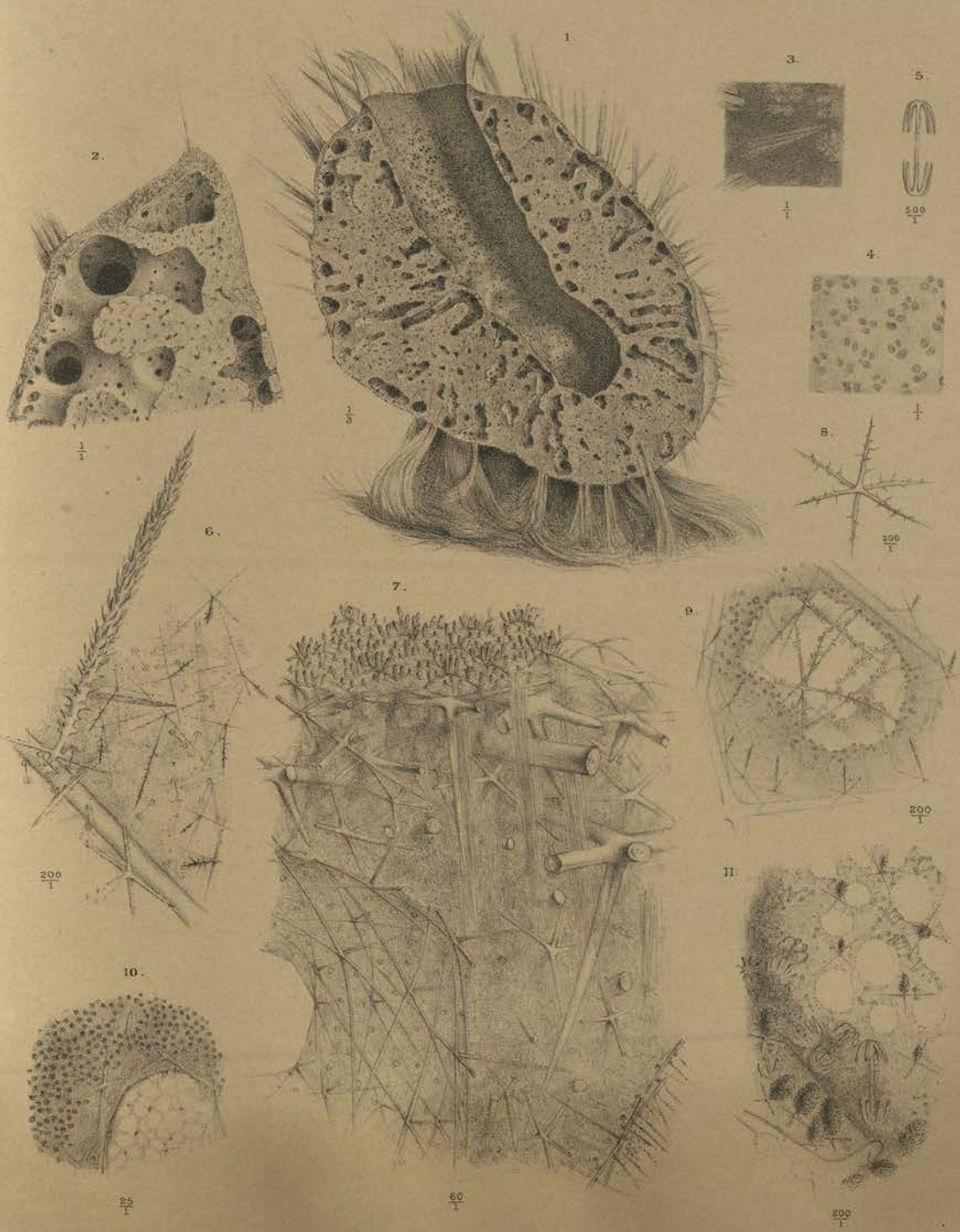
Fig. 8. Oxyhexact with straight echinated rays; × 200.

Fig. 9. One of the pores and small autocanalicular pentact pinuli from a large passage; × 200.

Fig. 10. Portion of one of the pores within the gastral cavity; × 25.

Fig. 11. Portion surrounding the pores in the wall of the gastral cavity; × 200.

This plate was arranged by Sir Wyville Thomson.



Geo. West lith. ad nat.

F. Huth lith. Edin.

PHERONEMA GIGANTEUM, F. E. Schulze.

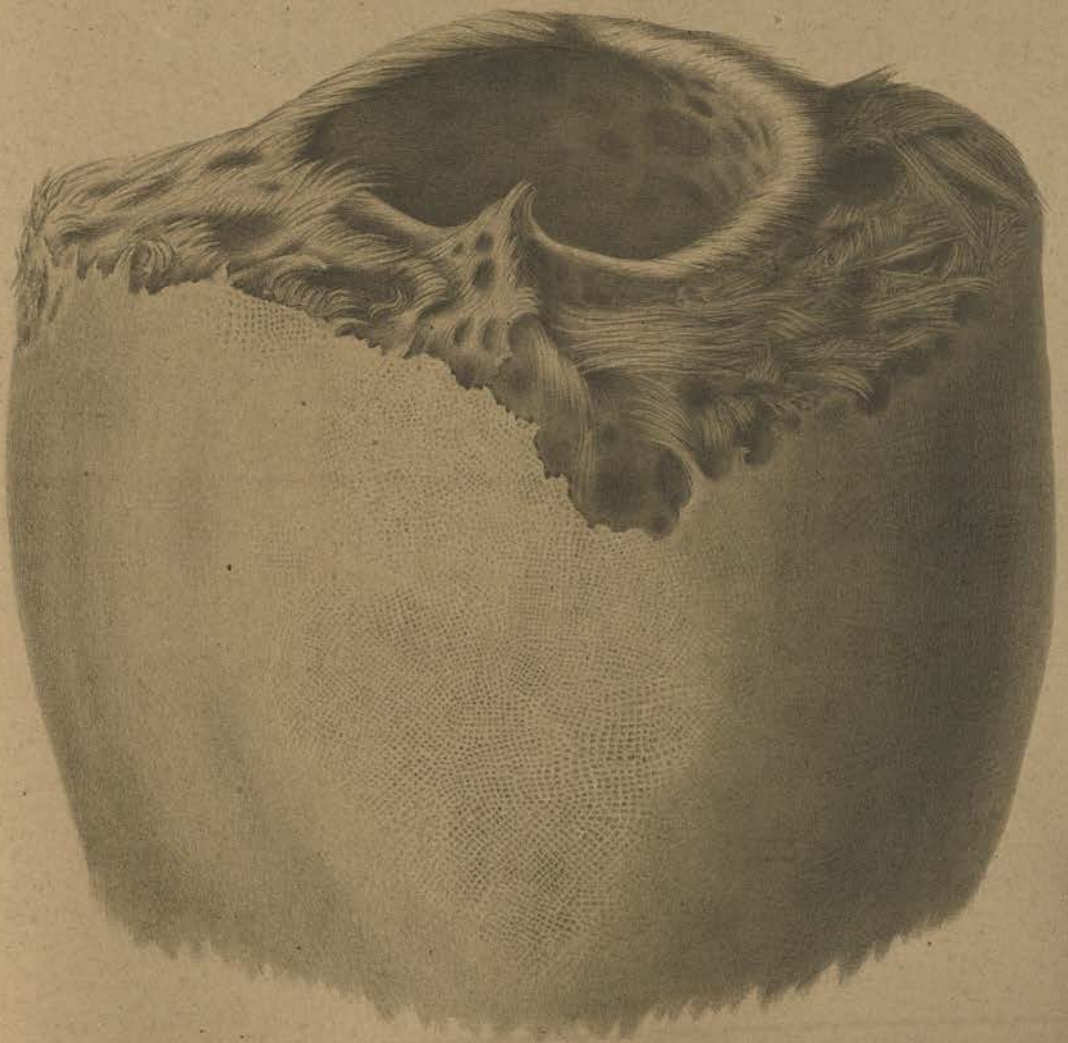
PLATE XLVII.

PLATE XLVII.

PAGE

Poliopogon gigas, F. E. S., ... 257

Dried specimen, very much damaged in the superior and inferior parts; from a photograph; one-third natural size.



POLIOPOGON GIGAS. F. E. Schulze.

PLATE XLVIII.

PLATE XLVIII.

PAGE

Poliopogon gigas, F. E. S., ... 257

Fig. 1. Vertical section of a portion, preserved in alcohol (combination figure); × 60.

Fig. 2. Large amphidisc; × 300.

Figs. 3, 7. Small smooth oxydiact; × 300.

Figs. 4, 6. Small amphidiscs; × 300.

Fig. 5. Autodermal pentact pinulus; × 300.

Fig. 8. Autodermal hexact pinulus; × 300.

Fig. 9. Outer view of an autodermal pentact pinulus; × 300.

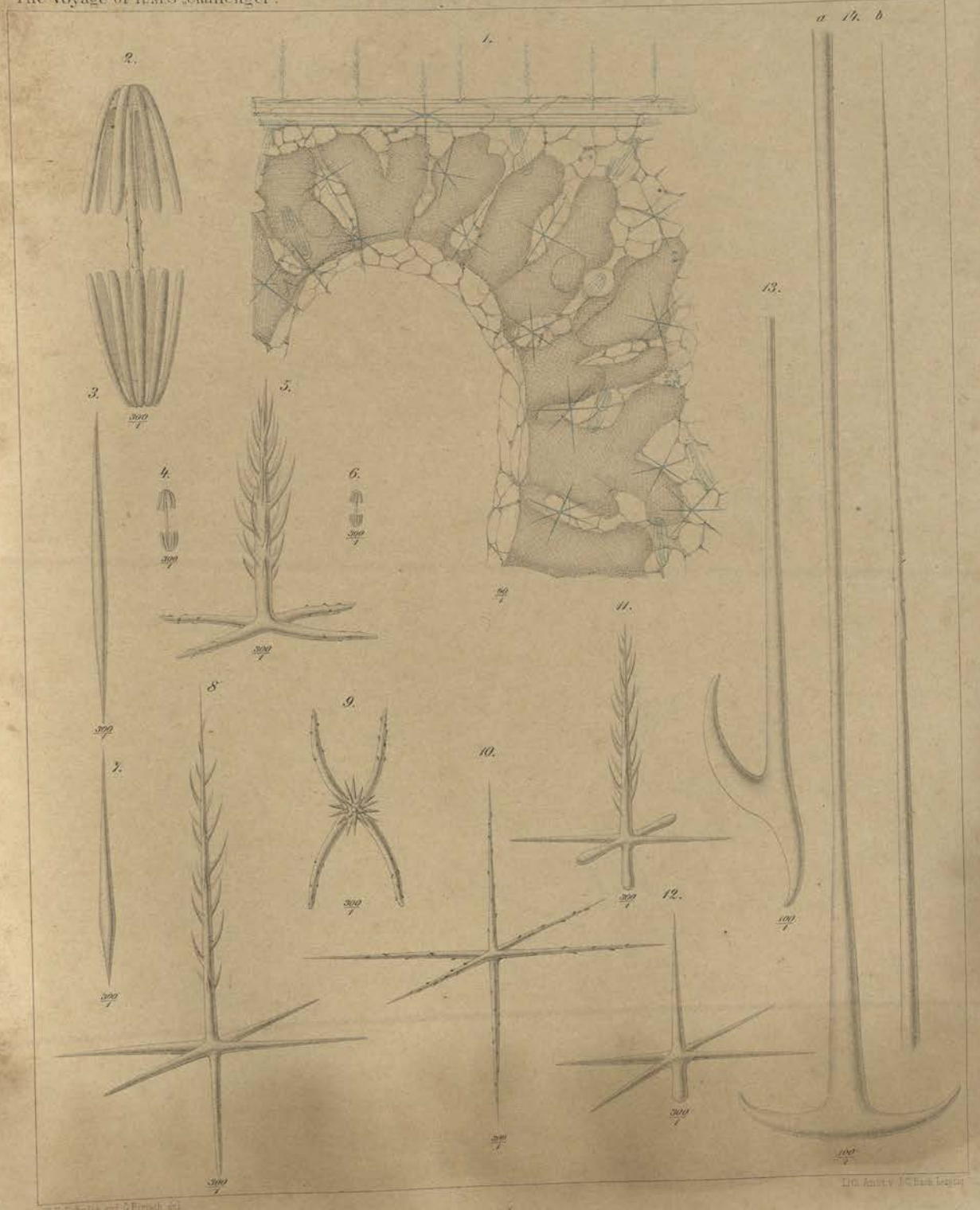
Fig. 10. Oxyhexact with straight echinated rays; × 300.

Fig. 11. Autodermal hexact pinulus; × 300.

Fig. 12. Hexact with five pointed and one rounded smooth rays; × 300.

Fig. 13. Inferior part of an abnormal anchor-like spicule of the basal tuft; × 100.

Fig. 14*a*. Inferior, and Fig. 14*b* superior, part of a normal anchor-like spicule of the basal tuft; × 100.



F. E. Schulze and G. Pritsch del.

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POLIOPOGON GIGAS. F. E. Schulze.

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PLATE XLIX.

PLATE XLIX.

PAGE

Poliopogon amadou, Wyville Thomson, ... 254

A dried specimen; half natural size.

POLIOPOGON AMADOU wyville Thomson.

PLATE L.

PLATE L.

PAGE

Poliopogon amadou, Wyville Thomson, ... 254

Fig. 1. Vertical section through the marginal portion (combination figure); × 25.

Fig. 2. Vertical longitudinal section of a very young specimen (combination figure); × 20.

Fig. 3. Uncinatum-like oxydiact; × 50.

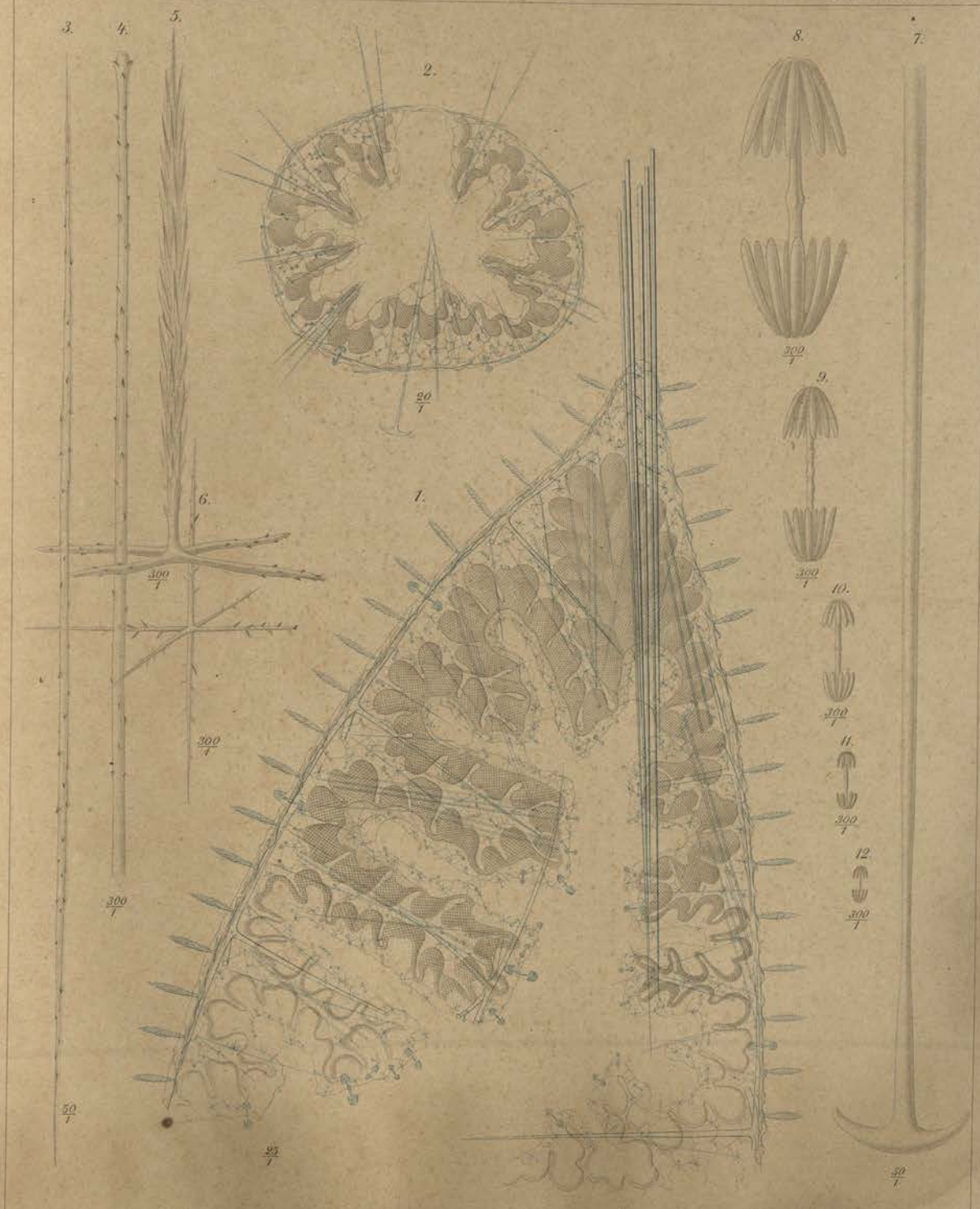
Fig. 4. Superior end of a marginal spicule; × 300.

Fig. 5. Autodermal pentact pinulus; × 300.

Fig. 6. Oxyhexact with straight echinated rays; × 300.

Fig. 7. Inferior end of an anchor-like spicule of the basal tuft; × 50.

Figs. 8–12. Large, middle-sized, and small amphidiscs; × 300.



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POLIOPOGON AMADOU. Wyville Thomson.

PLATE LI.

PLATE LI.

PAGE

Semperella schultzei, Semper, ... 261

Fig. 1. A specimen, preserved in alcohol; two-thirds natural size.

Fig. 2. Hypodermal pentact; × 20.

Fig. 3*a*. Uncinatum-like oxydiact, with curved barbs; × 20.

Figs. 3 *b*, *c*, *d*. Superior, middle, and inferior part of an uncinatum-like oxydiact, with curved barbs; × 200.

Fig. 4. Large autodermal pentact pinulus; × 200.

Fig. 5. Smaller but strong autodermal pentact pinulus; × 200.

Fig. 6. Small uncinatum-like oxydiact; × 200.

Fig. 7. Small amphidisc; × 500.

Figs. 8, 9. Middle-sized amphidiscs; × 200.

Fig. 10. Large amphidisc; × 200.

Fig. 11. Imperfect (young) middle-sized amphidisc; × 200.

Fig. 12. Slender middle-sized amphidisc; × 500.

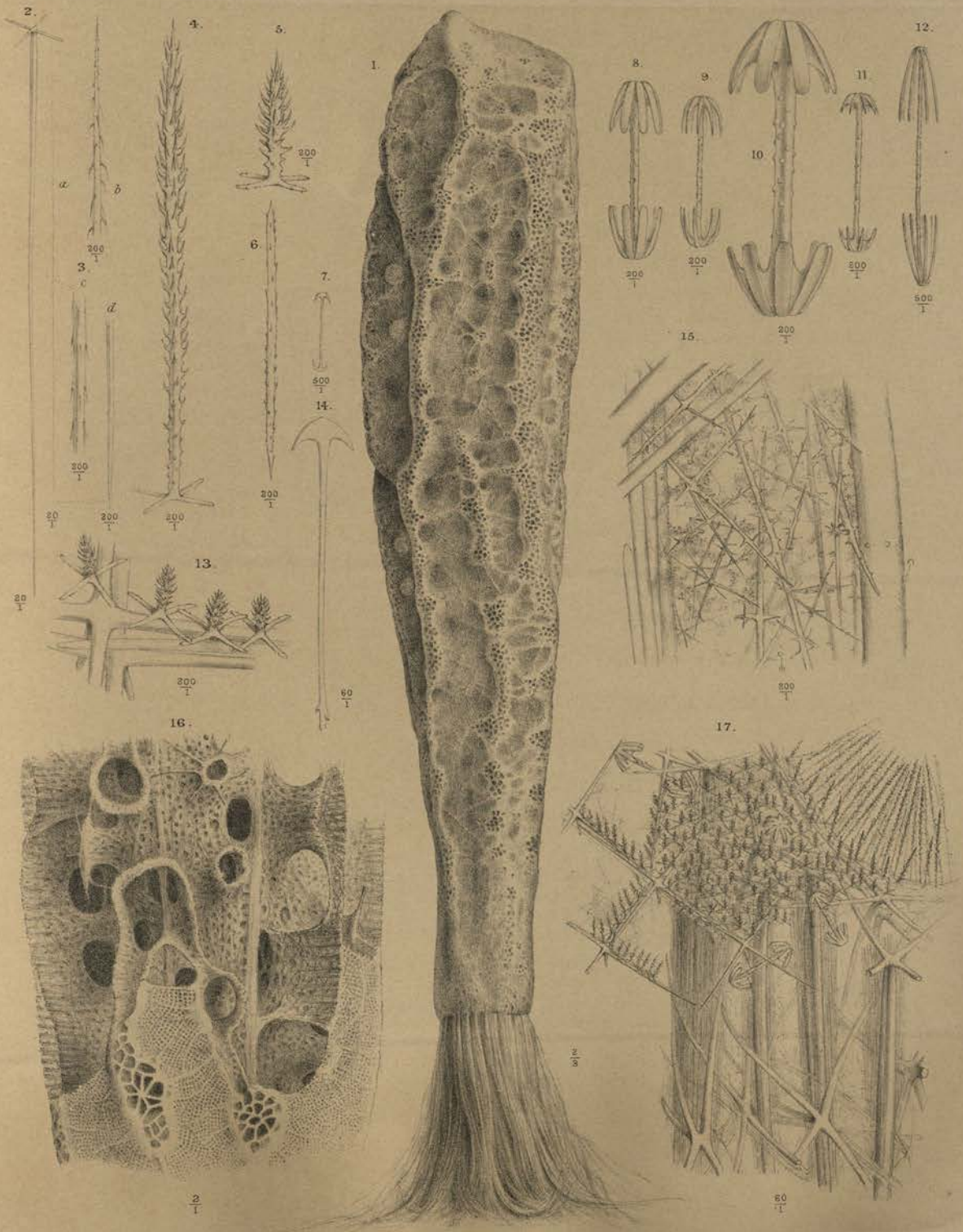
Fig. 13. Fragment of the dermal skeleton, with some smaller autodermal pentact pinuli; × 200.

Fig. 14. Inferior part of an anchor-like spicule of the basal tuft; × 60.

Fig. 15. Fragment of the parenchymal skeleton; × 200.

Fig. 16. Part of the lateral side, outer view; × 2.

Fig. 17. Fragment of the dermal skeleton; × 60.



Geo. West, lith. ad nat.

F. Huth, Lith. Edin.r

SEMPERELLA SCHULTZEI, C. Semper

PLATE LII.

PLATE LII.

PAGE

Semperella schultzei, Semper, ... 261

Fig. 1. Ideal transverse section through the middle portion; natural size.

Fig. 2. A specimen, preserved in alcohol, with a *Palythoa* investment on the basal tuft; probably a young specimen; natural size.

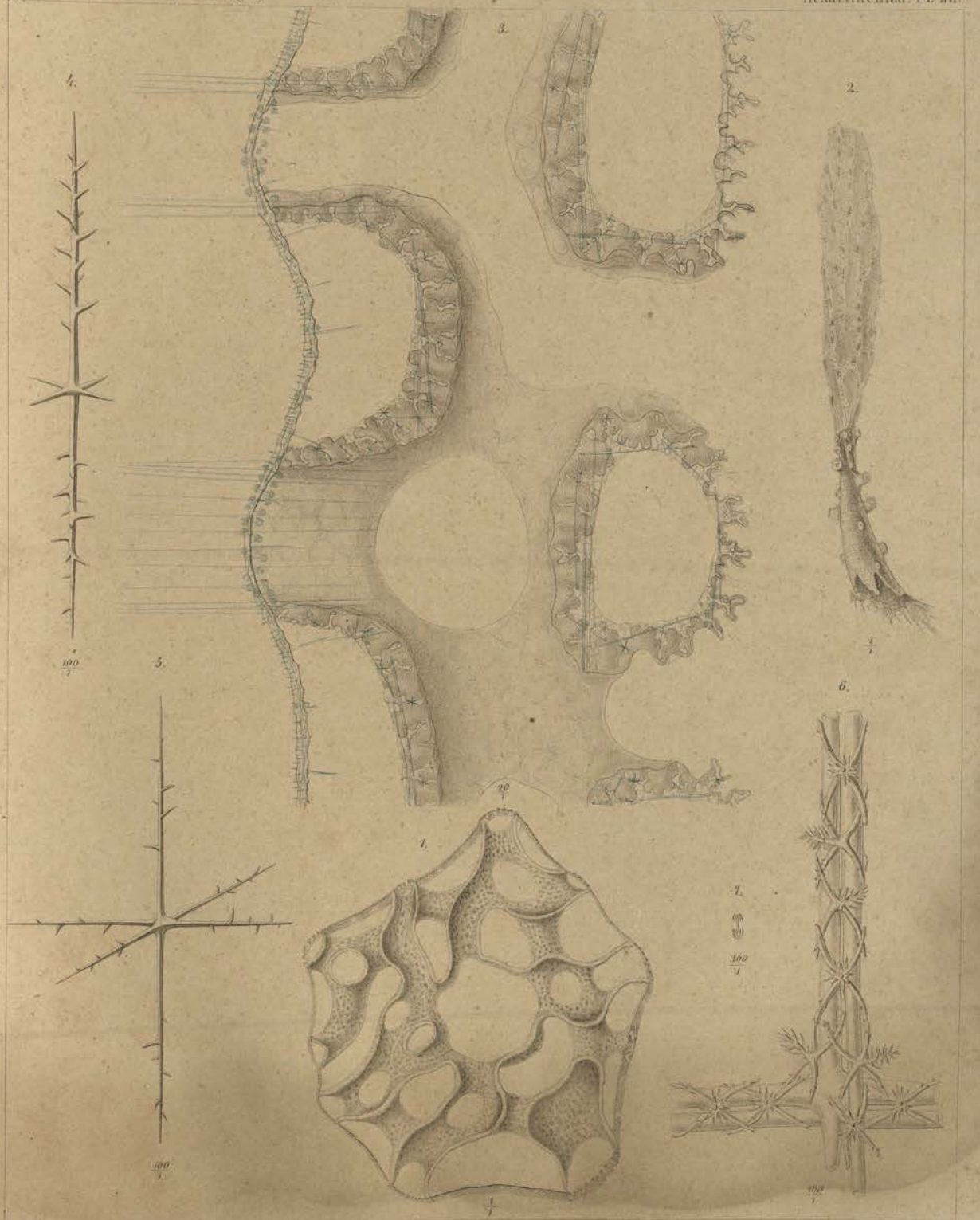
Fig. 3. External part of a transverse section of the young specimen shown in fig. 2 (combination figure); × 20. The pinuli in the outer side of the terminal oscular sieve-plates have been erroneously omitted.

Fig. 4. Oxyhexact with two long echinated and four short smooth rays; × 100.

Fig. 5. Oxyhexact with straight echinated rays; × 100.

Fig. 6. Fragment of dermal skeleton; × 100.

Fig. 7. Small amphidisc; × 300.



SEMPERELLA SCHULTZEI. C. Semper.

PLATE LIII.

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PLATE LIII.

PAGE

Figs. 1, 2. *Polylophus philippinensis*, Gray, . . 133

Fig. 1*a*, *b*. Very young specimens; natural size; *a*, probably fixed; with oscular aperture; *b*, free; without oscular aperture; natural size.

Fig. 2. Longitudinal section of a small bud (combination figure); × 20.

Figs. 3–5. *Lanuginella pupa*, O. Schmidt, . . 130

Fig. 3*a*, *b*. Young specimens, not fixed; natural size.

Fig. 4. A very young specimen, of globular form, without an oscular aperture; × 30.

Fig. 5. Longitudinal section of a young specimen, with commencing formation of the oscular area; × 70.

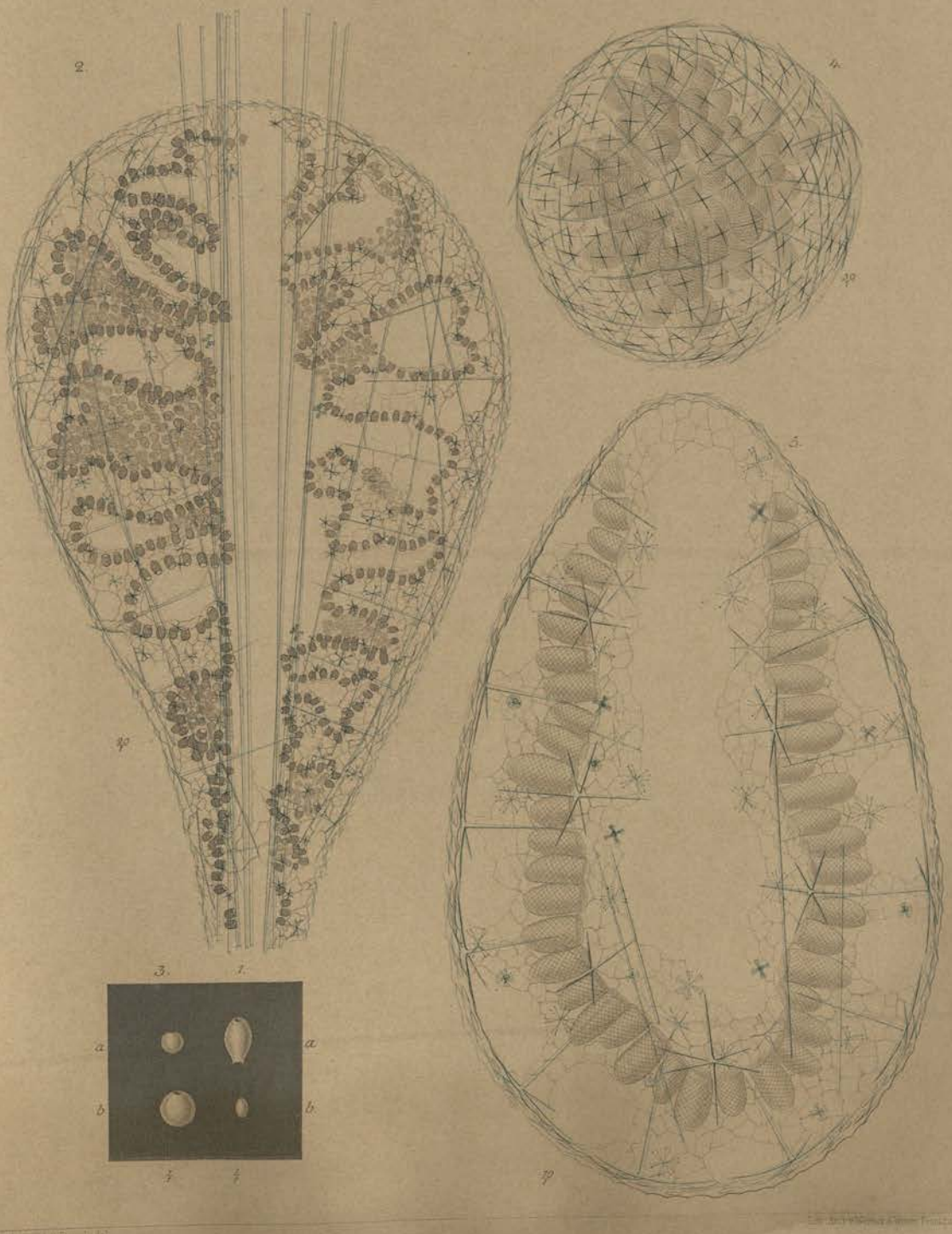


Fig. 1-2. POLYLOPHUS PHILIPPINENSIS. J. E. Gray. — Fig. 3-5. LANUGINELLA PUPA. Osc. Schmidt.

PLATE LIV.

PLATE LIV.

PAGE

Polylophus philippinensis, Gray, ... 133

Fig. 1. A specimen preserved in alcohol, with numerous buds of various sizes and ages; natural size.

Fig. 2. Vertical section of the outer marginal portion (combination figure); × 50.

Fig. 3. Discohexaster belonging to *Lanuginella pupa*, erroneously put in this plate; × 450.

Fig. 4. Plumicome from the subdermal trabecular work; × 300.

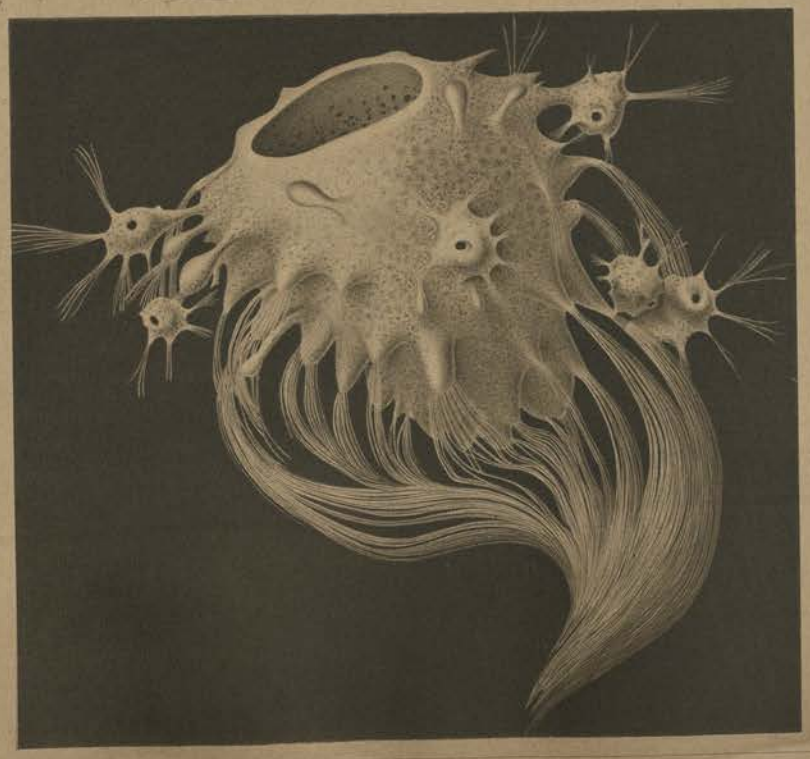
Fig. 5. Oxyhexaster with long principal rays; × 300.

Fig. 6. Longitudinal section of a principal ray, with terminal rays of a plumicome; × 1000.

Fig. 7. Autodermal tetract with somewhat bent, rough, rounded rays; × 100.

Fig. 8. Hexact with straight rough rays, probably intruded and not belonging to *Polylophus philippinensis*; × 100.

Fig. 9. Inferior part of an anchor-like pentact of the basal tuft; × 50.



POLYLOPHUS PHILIPPINENSIS J.E.Gray.

PLATE LV.

PLATE LV.

PAGE

Rossella antarctica, Carter, ... 139

Fig. 1. A specimen, preserved in alcohol; natural size.

Fig. 2. Vertical section of the outer portion of the lateral wall (combination figure); × 100.

Fig. 3. Autodermal pentact with rough rounded rays; × 100.

Fig. 4. Autodermal tetract with straight, rough, rounded rays; × 100.

Fig. 5. Autogastral hexact with straight, rough, rounded rays; × 100.

Fig. 6. Parenchymal discohexaster; × 450.

Fig. 7. Portion of the marginal part; natural size.

Fig. 8. Discohexact, perhaps extrinsic and intruded; × 300.

Fig. 9. Outer part of a pleural pentact prostale; × 100.

Fig. 10. Parenchymal diact, with four central cruciately disposed knobs, and rough, rounded ends; × 100.

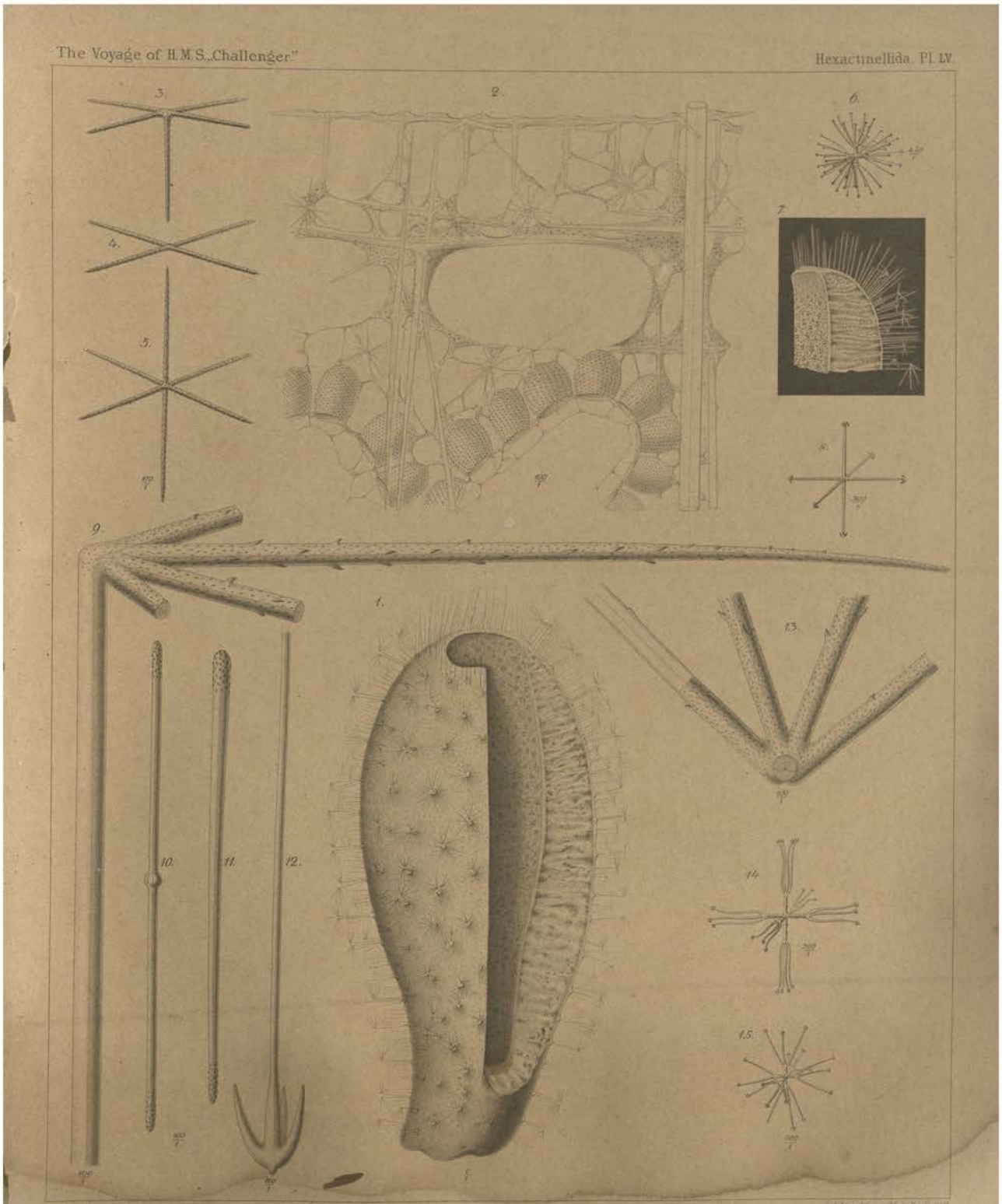
Fig. 11. Parenchymal rod-like spicule, with rough, rounded ends; × 100.

Fig. 12. Inferior part of an anchor-like spicule of the basis; × 100.

Fig. 13. Outer view of a pleural pentact prostale; × 100.

Fig. 14. Discohexaster with slender perianth-like bundles of terminal rays; × 300

Fig. 15. Discohexaster with three terminal rays on each principal; × 300.



ROSSELLA A[illegible] Carter.

PLATE LVI.

PLATE LVI.

Acanthascus grossularia, F. E. S.,

Fig. 1. A specimen, preserved in alcohol; natural size.

Fig. 2. Vertical section of the marginal portion; × 30.

Fig. 3. Discohexaster with perianth-like bundles of terminal rays; × 30

Fig. 4. Terminal rays of a discohexaster shown in fig. 3; × 1000.

Fig. 5. Autodermal tetract with straight, somewhat rough, rounded rays

Fig. 6. Autodermal pentact with straight, somewhat rough, rounde
× 100.

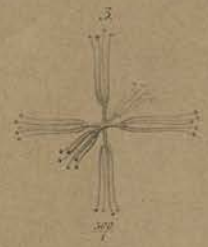
Figs. 7, 8. Oxyhexaster with long, straight, smooth, terminal rays; × 300

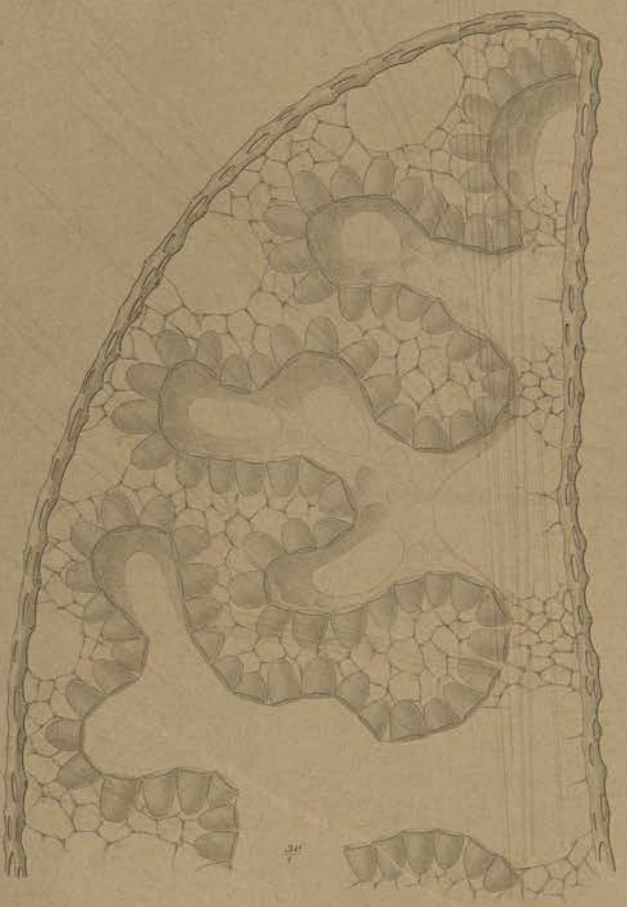
Fig. 9. Small discohexaster with three to four spined terminal rays; × 45

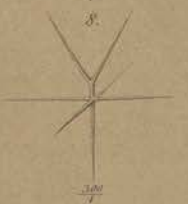
Fig. 10. Small discohexaster with much spined terminal rays; × 450.

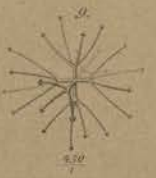
Fig. 11. Terminal expansion of a principal ray, with the terminals situated
disc; × 1000.

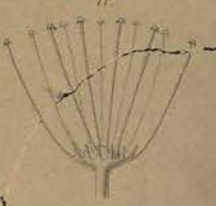
Fig. 12. Autogastral hexact with somewhat rough, pointed rays; × 100.

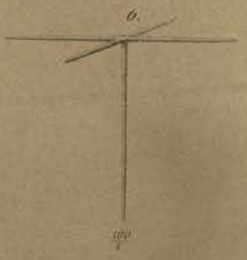












ACANTHASCUS GROSSULARIA. F.E.Schulze.

LVII.

PLATE LVII.

PAGE

Figs. 1–7. *Acanthascus cactus*, F. E. S., ... 148

Fig. 1. A dried specimen; natural size.

Fig. 2. Spicules of a section perpendicular to the outer surface, in natural position (combination figure); × 20.

Fig. 3. Oxyhexaster with long, bent, terminal rays; × 300.

Fig. 4. Discohexaster with some superumerary accessory radial thorns

Fig. 5. Spicules with six normal and two accessory ray

Fig. 6. Autodermal tetract with straight, rough, ro

Fig. 7. Autodermal pentact with straight,

Figs. 8–13. *A*

Fig. 8. Oxyhexaster with long, b

Fig. 9. Discohexaster with
× 450.

Fig. 10. Discohexaster

Fig. 11. Discohexaster

Fig. 12. Long

13.

Fig. 1-7. ACANTHASCUS CACTUS. F.E.Schulze. Fig. 8-13. ACANTHASCUS DUBIUS. F.E.Schulze.

PLATE LVIII.

PLATE LVIII.

Bathydorus fimbriatus, F

Fig. 1. Superior part of a broken specimen, preserved

Fig. 2. Vertical section through the lateral wall; × 6

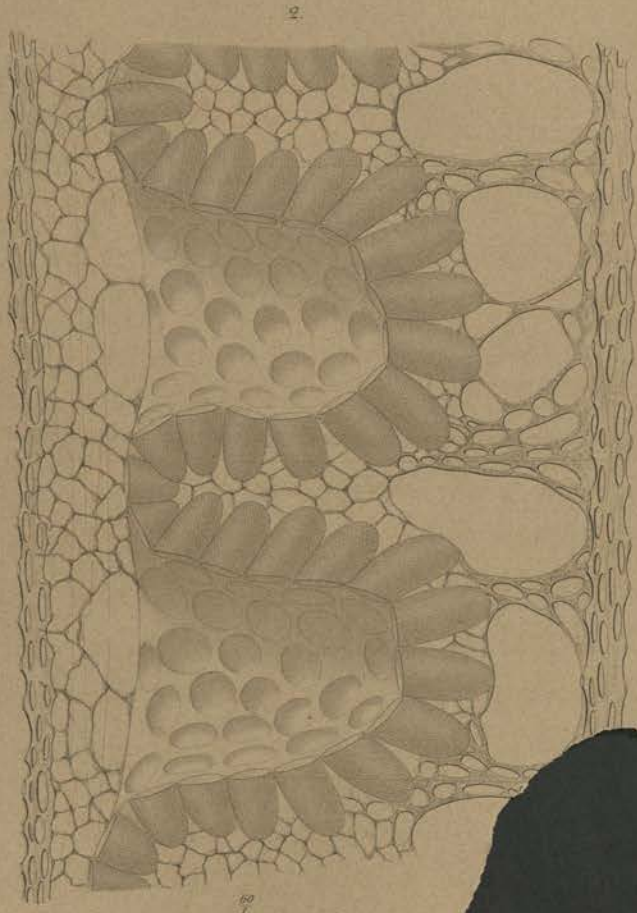
Fig. 3. Part of a parenchymal diact, with four crucia
and rough rounded ends; × 100.

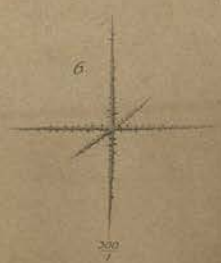
Fig. 4. Discohexaster with

Fig. 5. Autodermal

Fig. 6. Autogastra

Fig. 7. Oxyhexa





BATHYDORUS FIMBRIATUS. F.E.Schulze.

PLATE LIX.

PLATE LIX.

PAGE

Figs. 1–5. *Bathydorus stellatus*, F. E. S., . . 152

Fig. 1. A somewhat damaged specimen, preserved in alcohol; natural size.

Fig. 2. Oxyhexaster, whose principal rays are aborted; × 300.

Fig. 3. Great autodermal tetract with straight, rounded, rough rays; × 300.

Fig. 4. Small discohexaster; × 300.

Fig. 5. Autodermal rough diact with an annular central thickening and rounded ends; × 300.

Figs. 6–9. *Bathydorus spinosus*, F. E. S., . . 153

Fig. 6. Inferiorly damaged specimen, preserved in alcohol; natural size.

Fig. 7. Oxyhexact with straight, smooth, pointed rays; × 300.

Fig. 8. Oxyhexaster with S-like terminal rays; × 300.

Fig. 9. Oxyhexaster with irregularly bent terminal rays; × 300.

Figs. 10–18. *Bathydorus baculifer*, F. E. S., . . 154

Fig. 10. A fragment; natural size.

Dermal skeleton, in natural position; × 50.

3. Oxyhexasters with bent terminal rays; × 300.

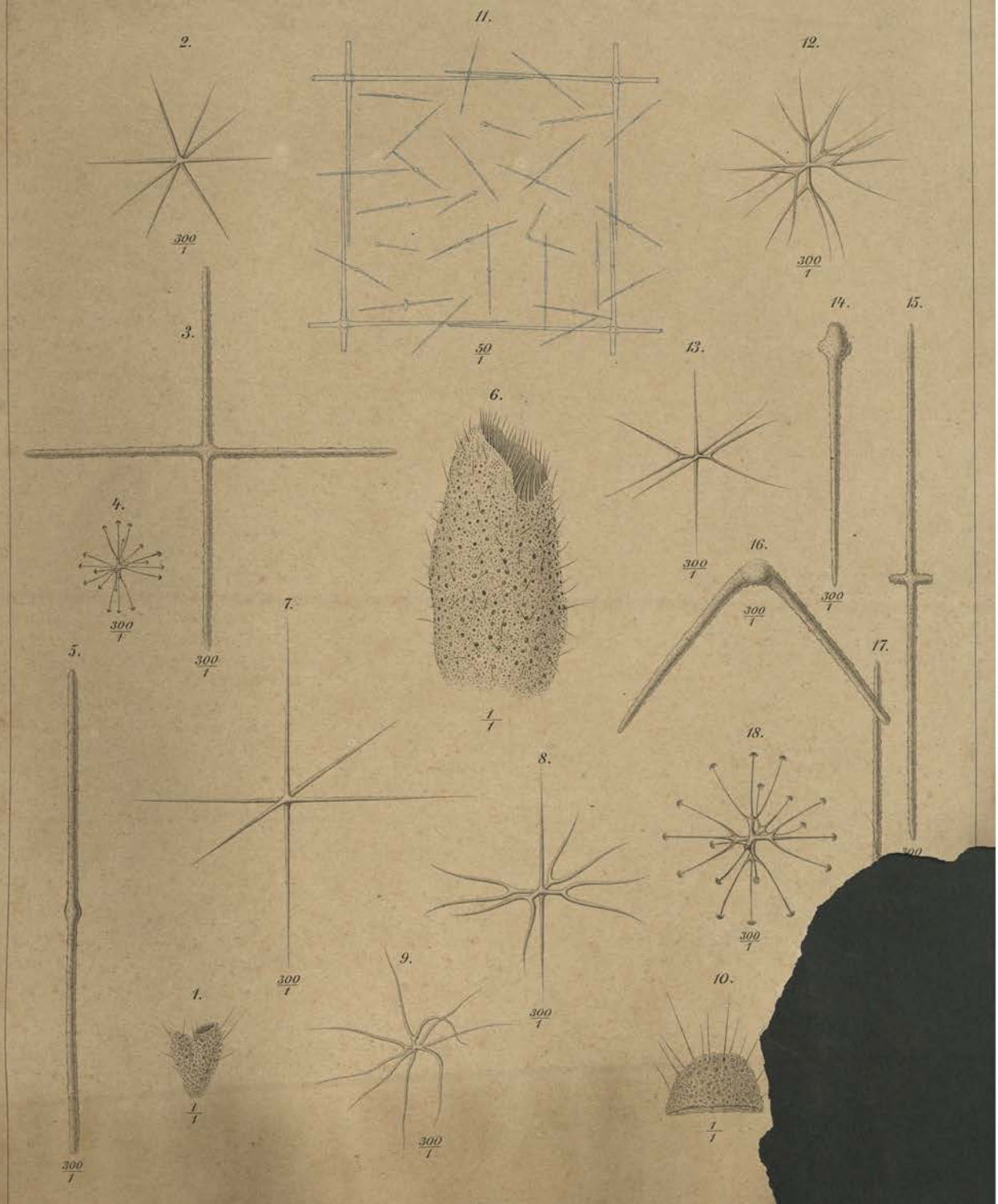
act with five rough knobs at the blunt (central) end, and a straight, ugh, rounded ray; × 300.

diact with two rough central knobs, and rough obtuse rays;

act with central knot, and straight rough rays; × 300.

t with central knot, and rough obtuse rays; × 300.

; × 300.



F.E.Schulze and G.Fritsch del.

Fig. 1-5. BATHYDORUS STELLATUS. F.E.Schulze. Fig. 6-9. BATHYDORUS SPINOSUS. F.E.Schulze.
Fig. 10-18. BATHYDORUS BACULIFER. F.E.Schulze.

PLATE LX.

PLATE LX.

PAGE

Aulocalyx irregularis, F. E. S., ... 174

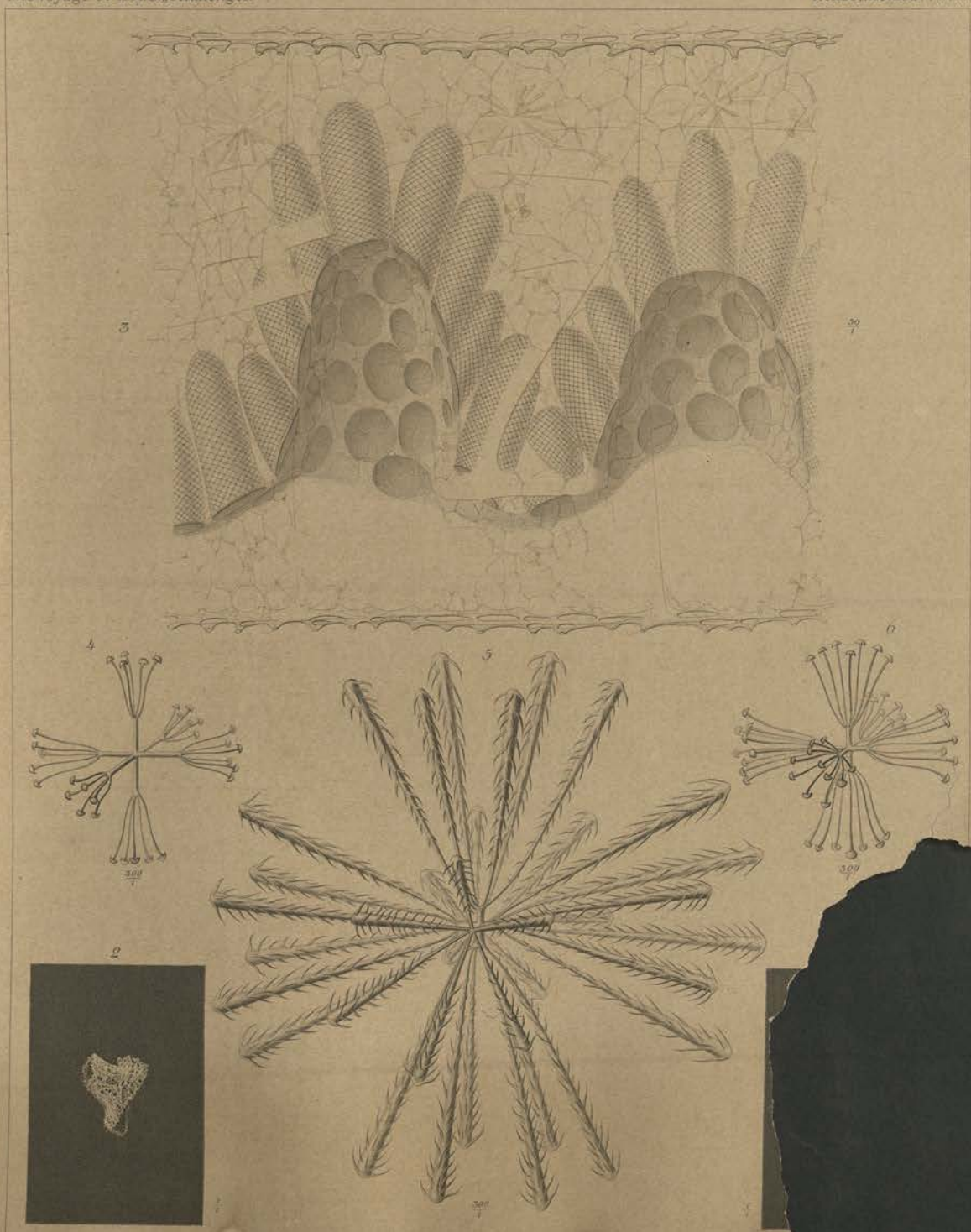
Fig. 1. Basal part of a partially macerated specimen; natural size.

Fig. 2. Macerated skeleton of a lateral tube; natural size.

Fig. 3. Transverse section of the wall (combination figure); × 50.

Figs. 4, 6. Discohexasters; × 300.

Fig. 5. Large hexaster with long clavate and barbed terminal rays; × 300.



F.E. Schulze and G. Fritsch del.

AULOCALYX IRREGULARIS. F.E. Schulze.

PLATE LXI.

PLATE LXI.

PAGE

Crateromorpha meyeri, Gray, ... 161

Fig. 1. A specimen, well preserved in alcohol; natural size and colour.

Fig. 2. Longitudinal section of the body and of a part of the stalk; natural size.

Fig. 3. Longitudinal section perpendicular to the surface of the superior part of the body, and of a part of the marginal fringe (combination figure); × 50.

Fig. 4. Dermal membrane, view of the exterior side; × 80.

Fig. 5. Free, strong small hexacts and parts of diacts from the stalk; × 100.

Fig. 6. Portion of the skeleton of the stalk. The spicules beginning to be united by a siliceous mass; × 100.

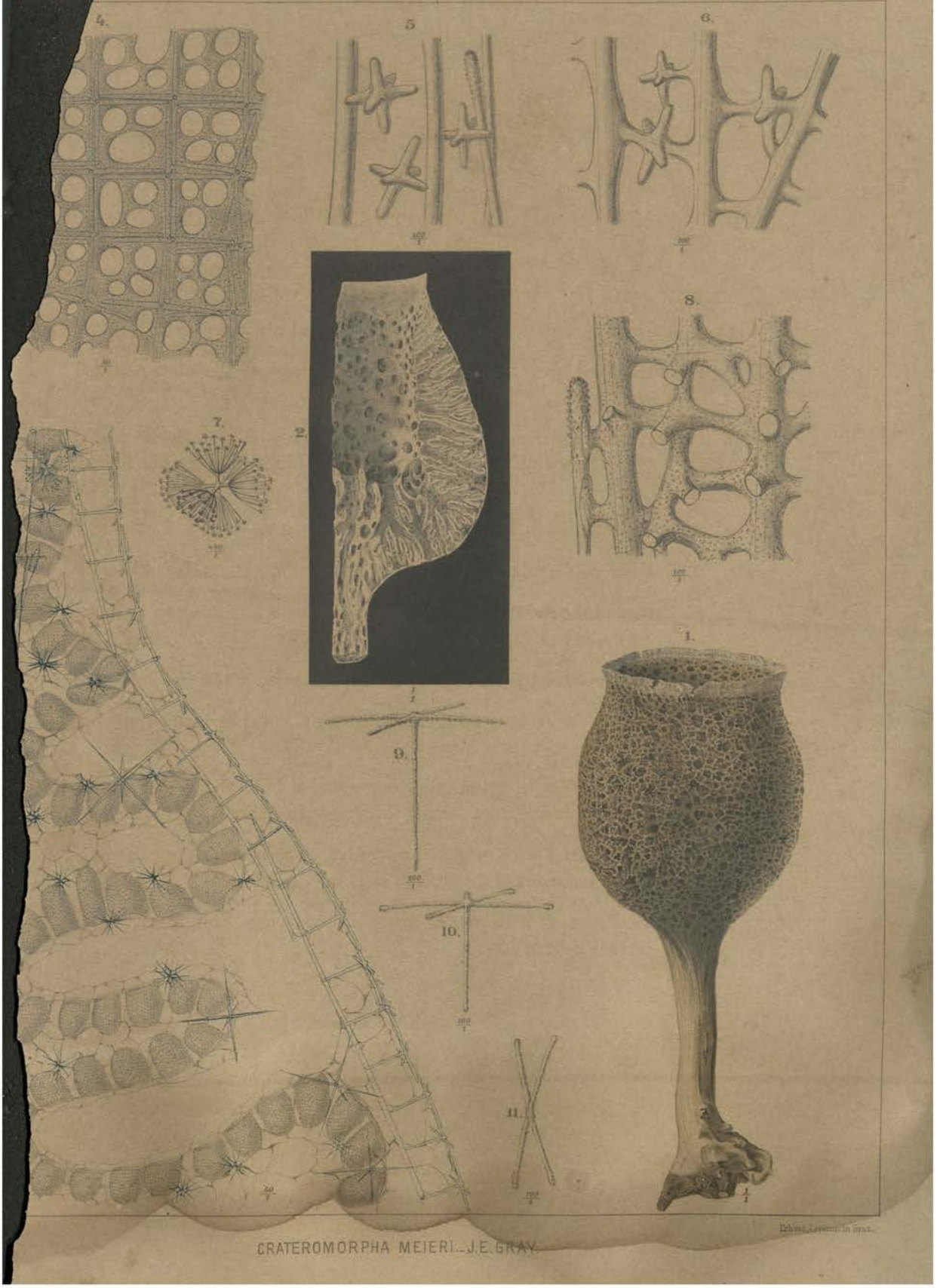
Fig. 7. Small discohexaster with numerous terminal rays; × 450.

Fig. 8. Portion of the skeleton of the stalk, strongly united by a siliceous ma × 100.

Fig. 9. Gastral pentact with rough, simply rounded rays, and a slightly jecting tubercle, representing the undeveloped sixth ray; × 100.

Fig. 10. Dermal pentact with rough, straight rays, club-shaped at the extren and a rudiment of the sixth (distal) ray; × 100.

Fig. 11. Dermal tetract with rough, somewhat bent rays, club-shaped extremities; × 100.



CRATEROMORPHA MEIERI. J.E. GRAY.

LIBRARY OF THE BOMBAY BRANCH OF THE ROYAL ASIATIC SOCIETY

PLATE LXII.

PLATE LXII.

Figs. 1–4. *Crateromorpha thierfelderi*, F. E. S.,

Fig. 1. A specimen, preserved in alcohol, somewhat damaged at the inferior part of the stalk; natural size.

Fig. 2. Oxyhexaster with short, principal, and long, S-shaped, bent terminal rays; × 300.

Fig. 3. Small discohexaster; × 250.

Fig. 4. Strong, somewhat bent diact, without any traces of the four aborted rays; × 50.

Figs. 5–8. Undetermined Crateromorphid,

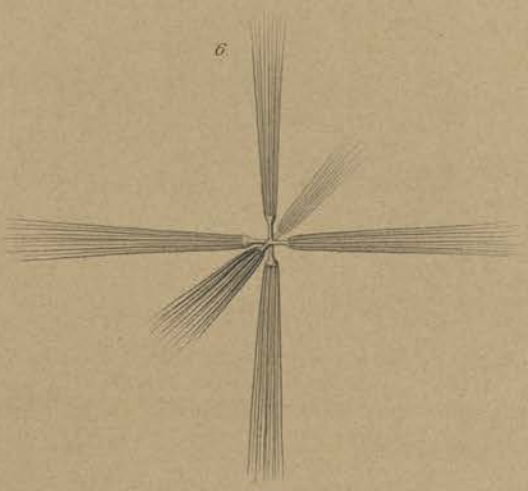
Fig. 5. Longitudinal axial section of the whole specimen, showing very well the simple unfolded layer of chambers in the earlier state of development (combination figure); × 20.

Fig. 6. Large graphiohexaster with long, straight, sharply pointed terminal rays; × 300.

Fig. 7. Blind terminal fundus of a chamber, inner view, showing the membrana reticularis and some pores of the chamber wall; × 400.

Fig. 8. Part of the chamber wall, outer view, showing the anastomosing cells of the membrana reticularis, one pore (*p*) and some of the cells lying upon the chamber wall; × 1000.

1/1



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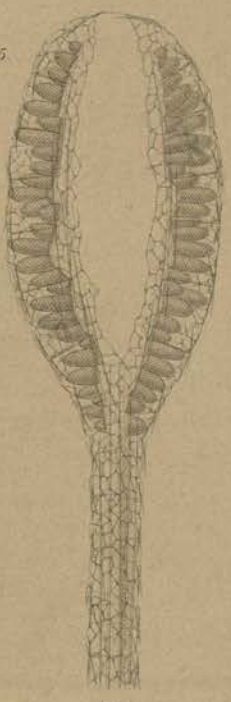

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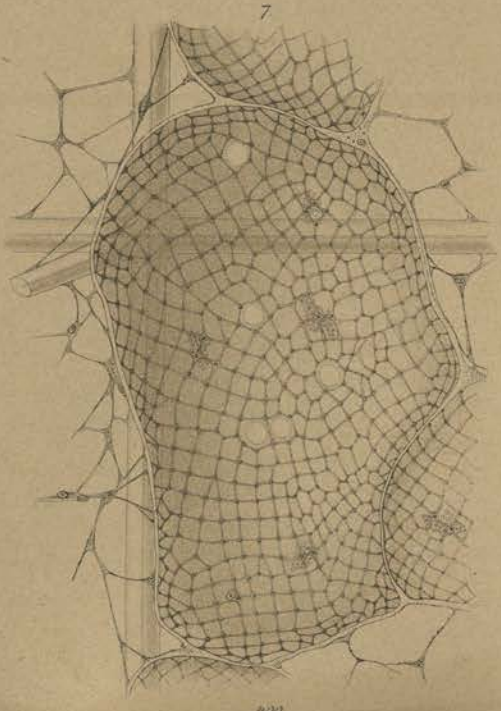

7.

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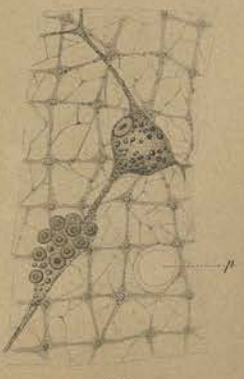
2.

300/1



8.

p

1000/1

3.

250/1

4.

50/1

Fig. 1-4. CRATEROMORPHA THIERFELDERI F.E. Schulze. Fig. 5 – 8. CRATEROMORPHID.

PLATE LXIII.

PLATE LXIII.

Crateromorpha murrayi, F. E. S., ...

Fig. 1. A specimen, preserved in alcohol, somewhat damaged at the basal part of the stalk; natural size.

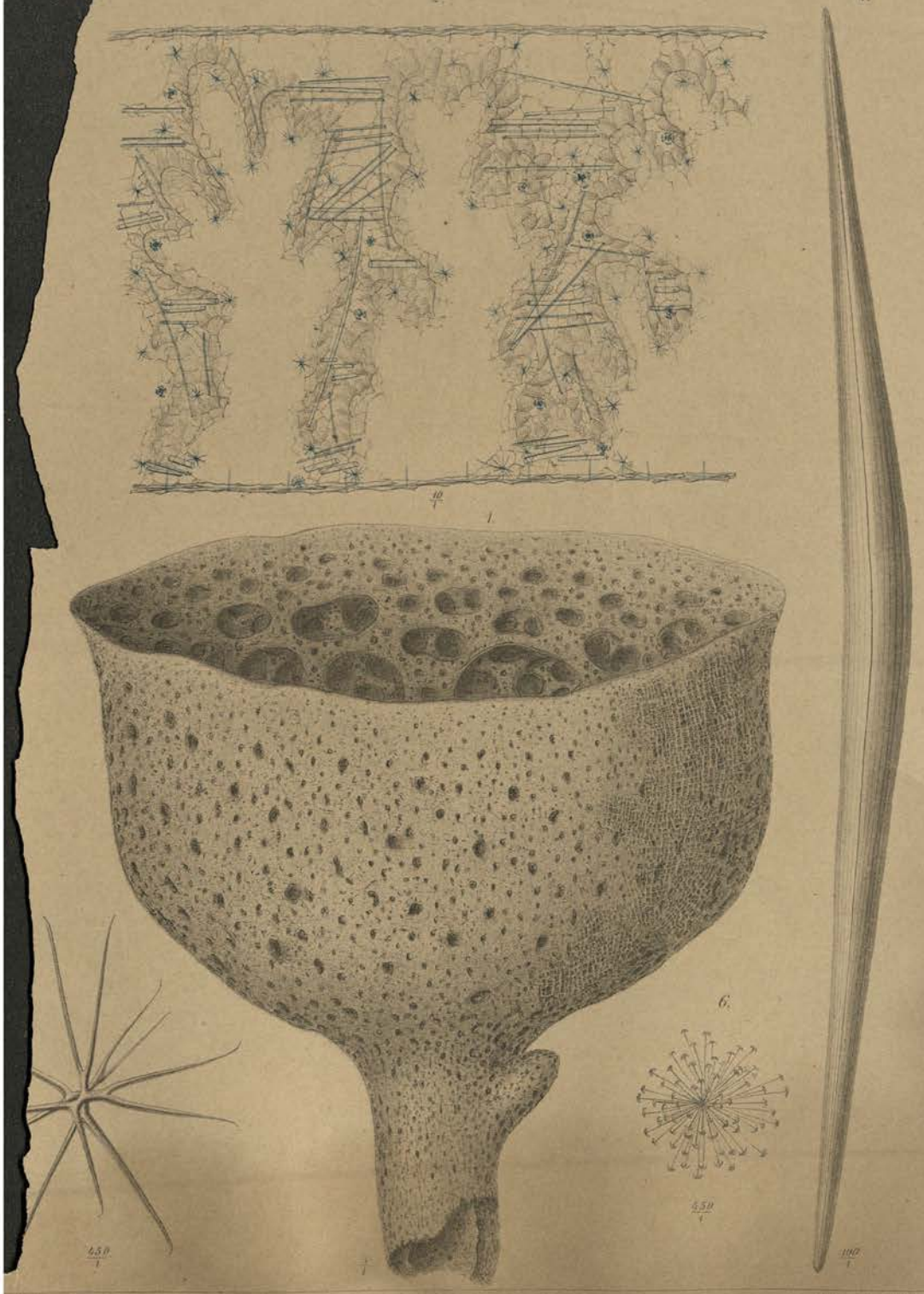
Fig. 2. Transverse section of the wall, near the superior sharp margin (combination figure); × 10.

Fig. 3. Part of a parenchymal diact, with club-shaped echinated ends; × 300.

Fig. 4. Bow-shaped, slightly bent, strong parenchymal diact; × 100.

Fig. 5. Oxyhexaster with long, slightly bent, terminal rays; × 450.

Fig. 6. Small oxyhexaster with very short principal and numerous terminal rays, the latter varying in length; × 450.



CRATEROMORPHA MURRAYI. F.E.Schulze.

PLATE LXIV.

PLATE LXIV.

PAG

Rhabdocalyptus mollis, F. E. S., ... 15

Fig. 1. A dried specimen; one-third natural size.

Fig. 2. Spicules of a transverse section of the wall near the free superior margin, in their natural arrangement; × 15

Fig. 3. Plain network of the skeleton in the basal surface, in contact with the supporting base; × 100.

Fig. 4. Part of a large hypodermal pentact, with echinated rays; × 50.

Fig. 5. Autodermal rough diact, with four cruciate central knobs; × 100.

Fig. 6. Autodermal rough diact, without central node; × 100.

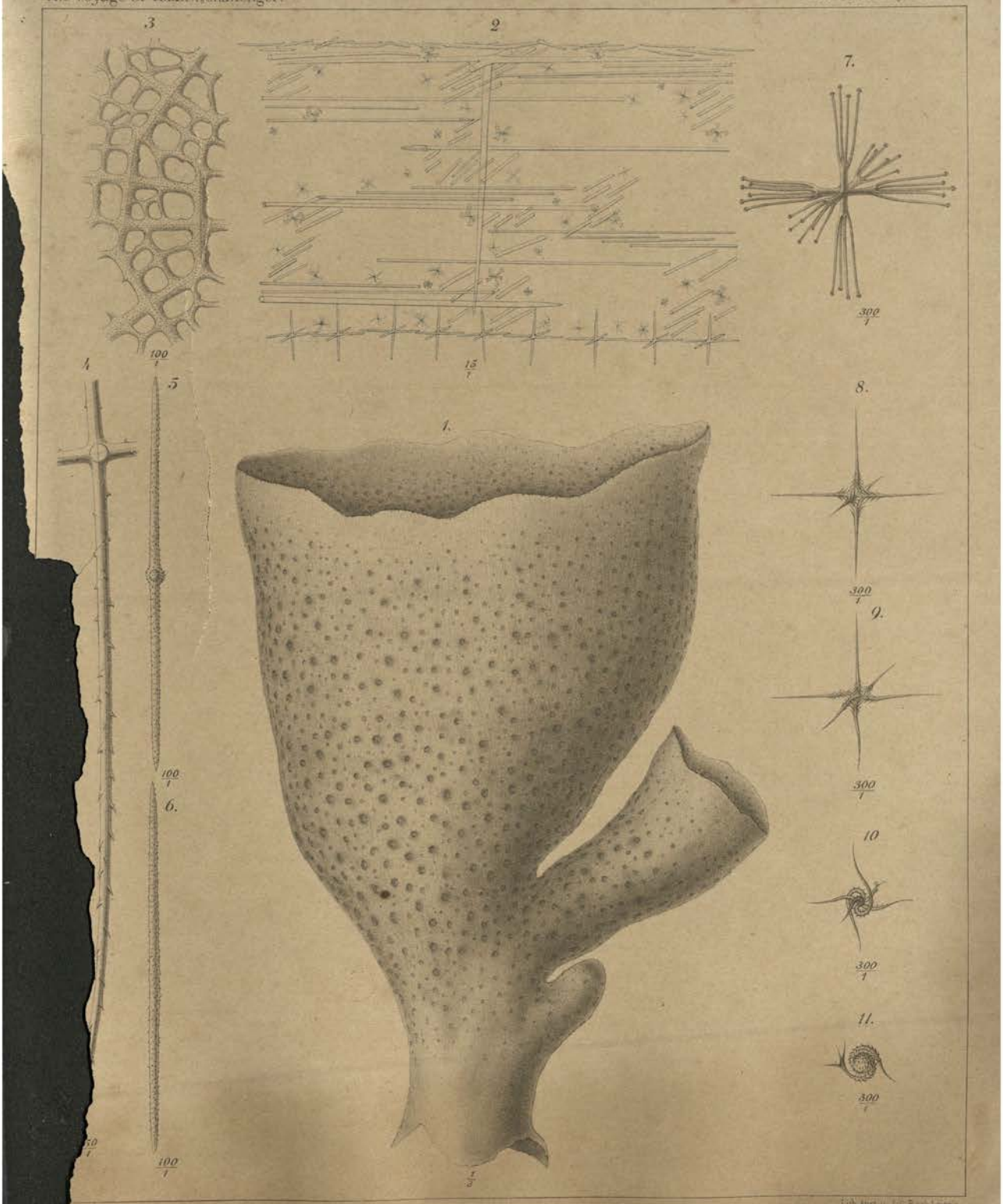
Fig. 7. Discohexaster with strong principal and long terminal rays; × 300.

Fig. 8. Oxyhexact with spines or barbs at the basis of the straight rays, directed obliquely inwards; × 300.

Fig. 9. Oxyhexact, similar to the one represented in fig. 8, with undulating rays; × 300.

Fig. 10. A similar oxyhexact, with spirally bent rays; × 300.

Fig. 11. Reduced spicule with two spirally bent rays; × 300.



RHABDOCALYPTUS MOLLIS F.E.Schulze.

PLATE LXV.

PLATE LXV.

Rhabdocalyptus roeperi, F. E. S., . .

Fig. 1. A specimen with damaged base, preserved in alcohol; natural size.

Fig. 2. Small (young?) specimen, without basal part; natural size.

Fig. 3. Parenchymal spicules with eight rays and interjacent knob-like tuber
Each principal ray bears three or more slightly diverging termin
× 300.

Fig. 4. Small discohexaster with numerous terminal rays; × 450.

Fig. 5. Oxyhexaster with long, undulating, terminal rays; × 300.

Fig. 6. Simple oxyhexact with straight smooth rays; × 300.

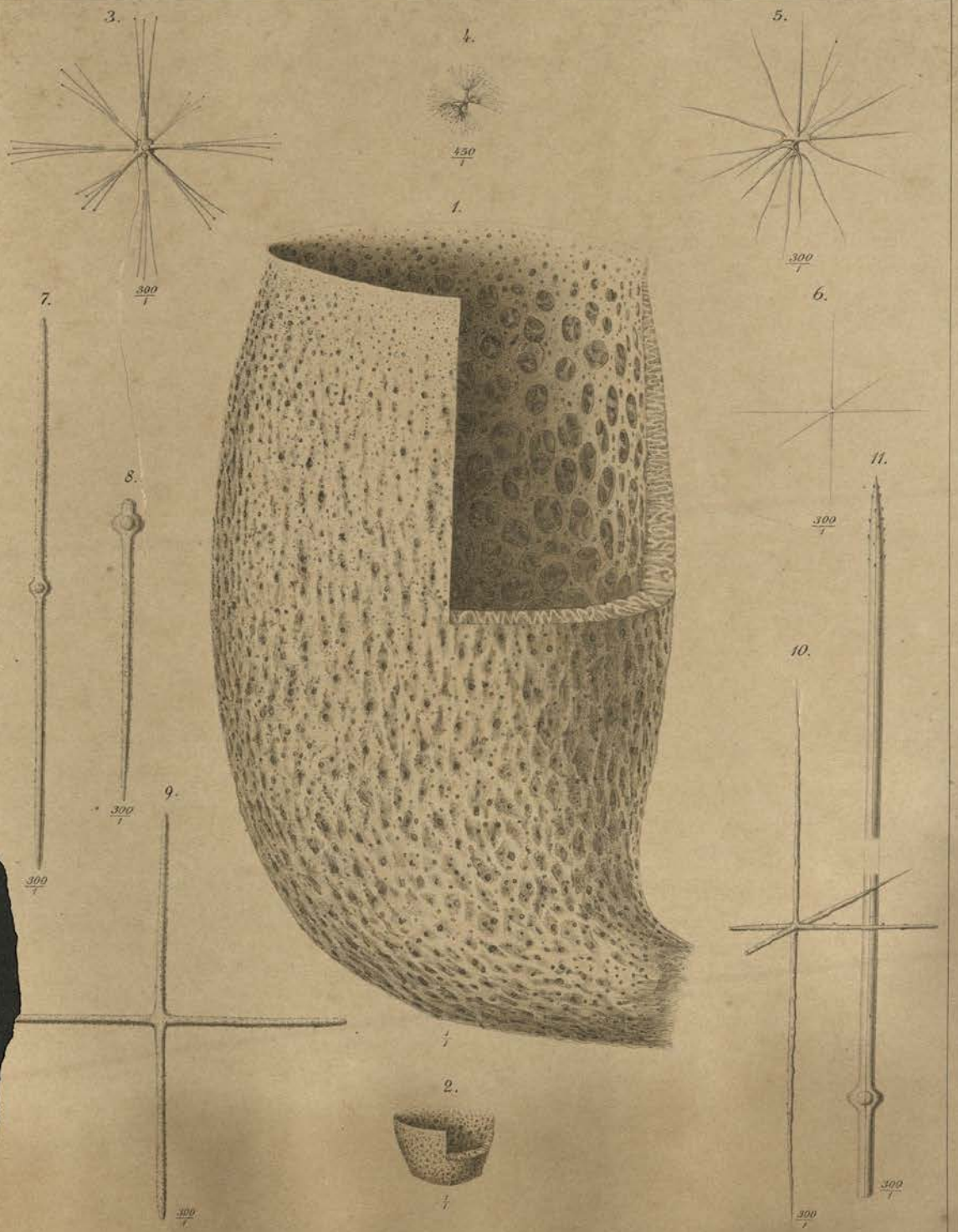
Fig. 7. Autodermal diact with rough rays, and four central cruciate knobs

Fig. 8. Autodermal monact with rough ray and five central knobs
sponding to the aborted rays; × 300.

Fig. 9. Autodermal tetract with rough rays, without any trace of the
rays; × 300.

Fig. 10. Gastral oxyhexact with rough rays; × 300.

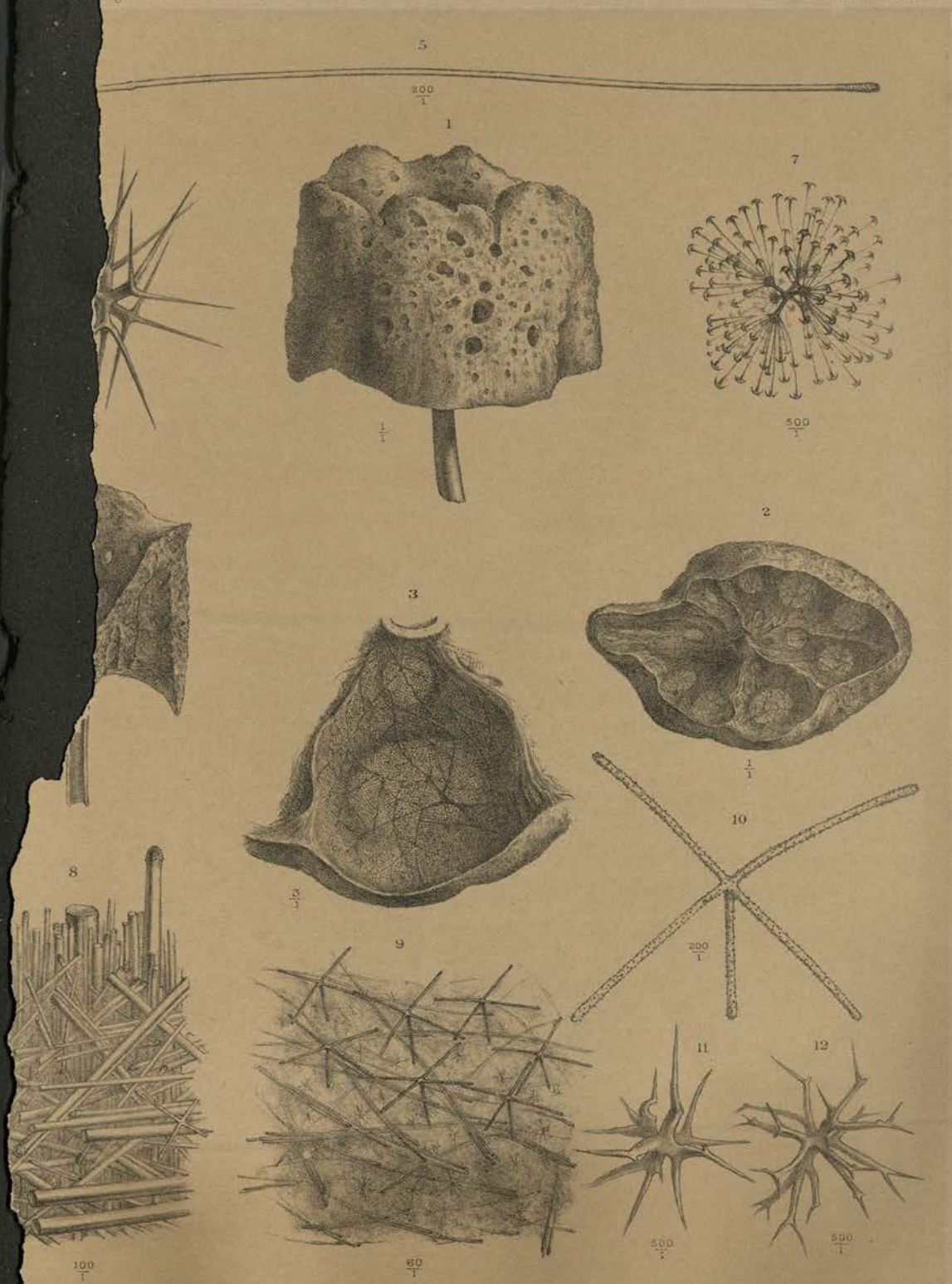
Fig. 11. Part of a parenchymal diact, with echinated ends and four cruciate kn
× 300.



...chulze and G.Firtsch del.

Lith. Anst. v. J. G. Bach, Leipzig.

RHABDOCALYPTUS ROEPERI. F.E.Schulze.



F. Huth, Lith. Edin.

AULOCHONE CYLINDRICA, F.E. Schulze.

PLATE LXVII.

PLATE LXVII.

PAGE

Crateromorpha tumida, F. E. S., . . . 166

(Erroneously named *Aulochone* on the Plate.)

Fig. 1. A somewhat damaged specimen, preserved in alcohol; natural size.

Fig. 2. Part of a long strong diact with club-shaped rough ends; × 100.

Fig. 3. Part of a small diact with club-shaped rough ends; × 200.

Fig. 4. Autodermal tetract, triact, and diact with rough rays; × 200.

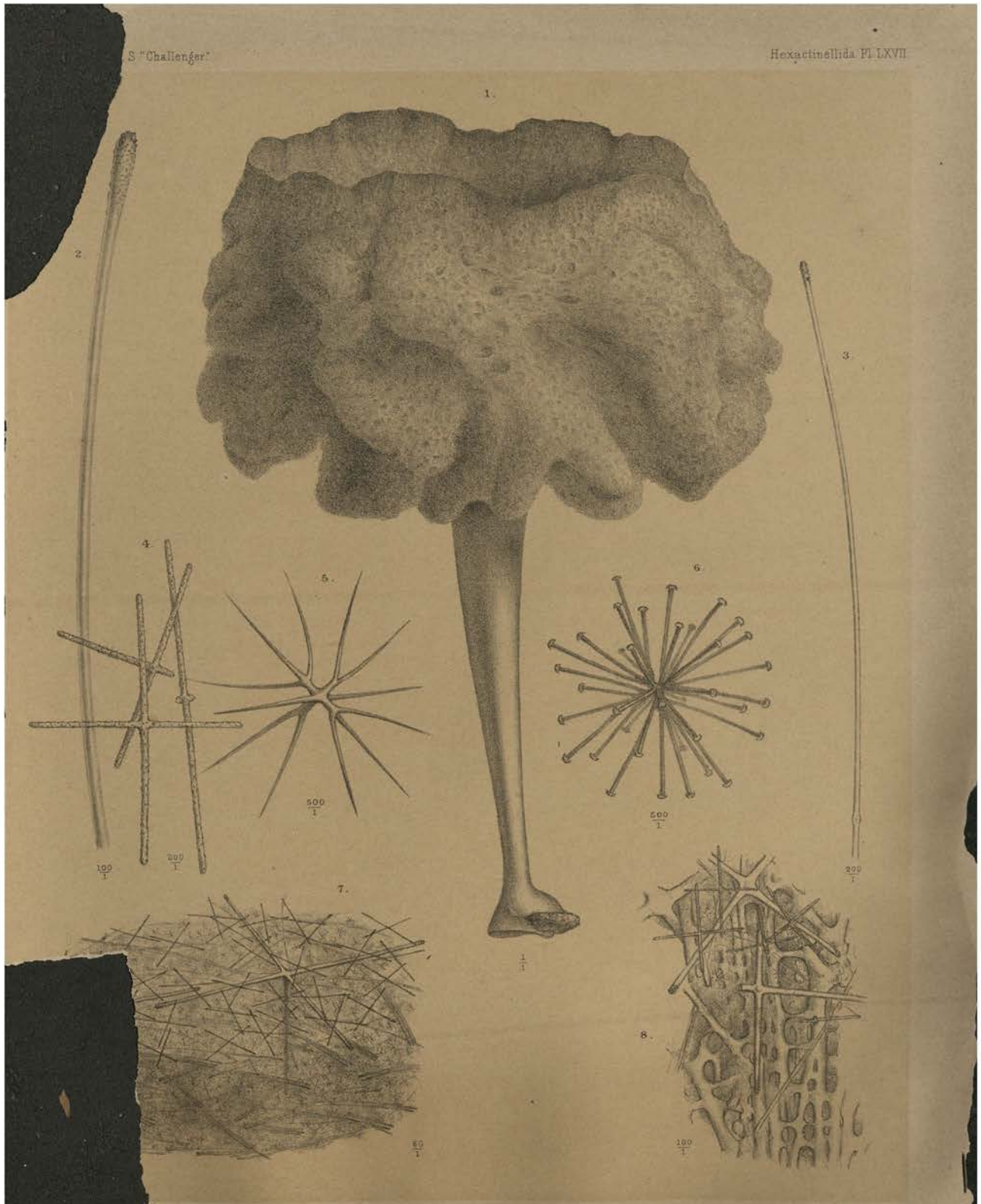
Fig. 5. Oxyhexaster with strong principal and terminal rays; × 500.

Fig. 6. Discohexaster with numerous terminal rays; × 500.

Fig. 7. Portion of the outer part of the body; × 60.

Fig. 8. Portion of the inferior part of the stem; × 100.

This Plate was arranged by Sir Wyville Thomson.



AULOCHONE TUMIDA, F.E. Schulze.

PLATE LXV

PAGE

ica, F. E. S., . . . 168

ugh the sharp inferior margin of

na tumida, F. E. S., . . 166

Aulochone on the Plate.)

e uppermost part of the pedicle (combina-

Aulochone lilium, F. E. S., . . . 171

lcohol; natural size.

h rough club-shaped end; × 450.

ng perianth-like terminal rays of different lengths;

long, rough, bent, terminal rays; × 450.

th the ends of the short broad rounded rays rough; × 450.

Fig 1. AULOCHONE CYLINDRICA. F.E.Schulze. Fig 2. AULOCHONE TUMIDA. F.E.Schulze. Fig. 3-7. AULOCHONE LILIUM. F.E.Schulze.

PLATE LXIX.

PLATE LXIX.

PAGE

Caulocalyx tener, F. E. S., . . . 172

Fig. 1. A much damaged specimen, preserved in alcohol; natural size.

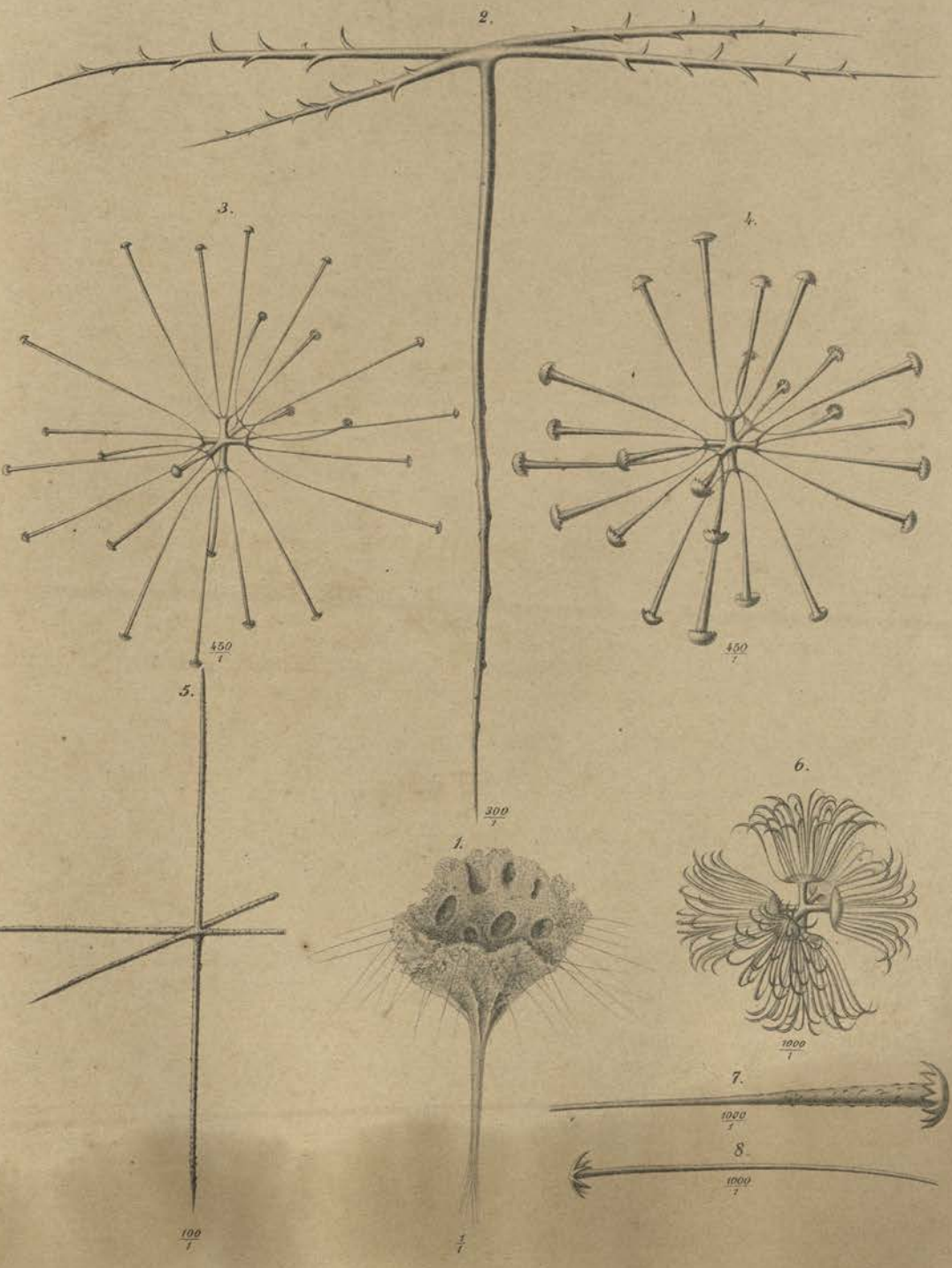
Fig. 2. Dermal (hypodermal?) pentact with echinated tangential rays and tuberous inner tangential ray; × 300.

Figs. 3, 4. Discohexaster with long bent terminal rays, increasing gradually in thickness towards the exterior; × 450.

Fig. 5. Gastral hexact with rough rays; × 100.

Fig. 6. Small plumicome; × 1000.

Figs. 7, 8. Terminal rays of discohexasters; × 1000.



F.E. Schulze and G. Fritsch, del.

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CAULOCALYX TENER. F.E. Schulze.

PLATE LXX.

PLATE LXX.

PAGE

Hyalostylus dives, F. E. S., . . . 110

Fig 1. A much damaged specimen, preserved in alcohol; natural size.

Fig. 2. Hexaster with thin terminal rays, whose exterior half consists of a cylindrical Typha spike-like portion; × 450.

Fig. 3. Discohexaster with long perianth-like situated, S-shaped, terminal rays of unequal lengths; × 450.

Fig. 4. Dermal (hypodermal?) hexact, whose external radial ray shows a terminal club-shaped thickening; × 300.

Figs. 5, 8. Curved rough oxydiacts; × 300.

Fig. 6. Rough club-shaped end of the external radial ray of a dermal hexact; × 300.

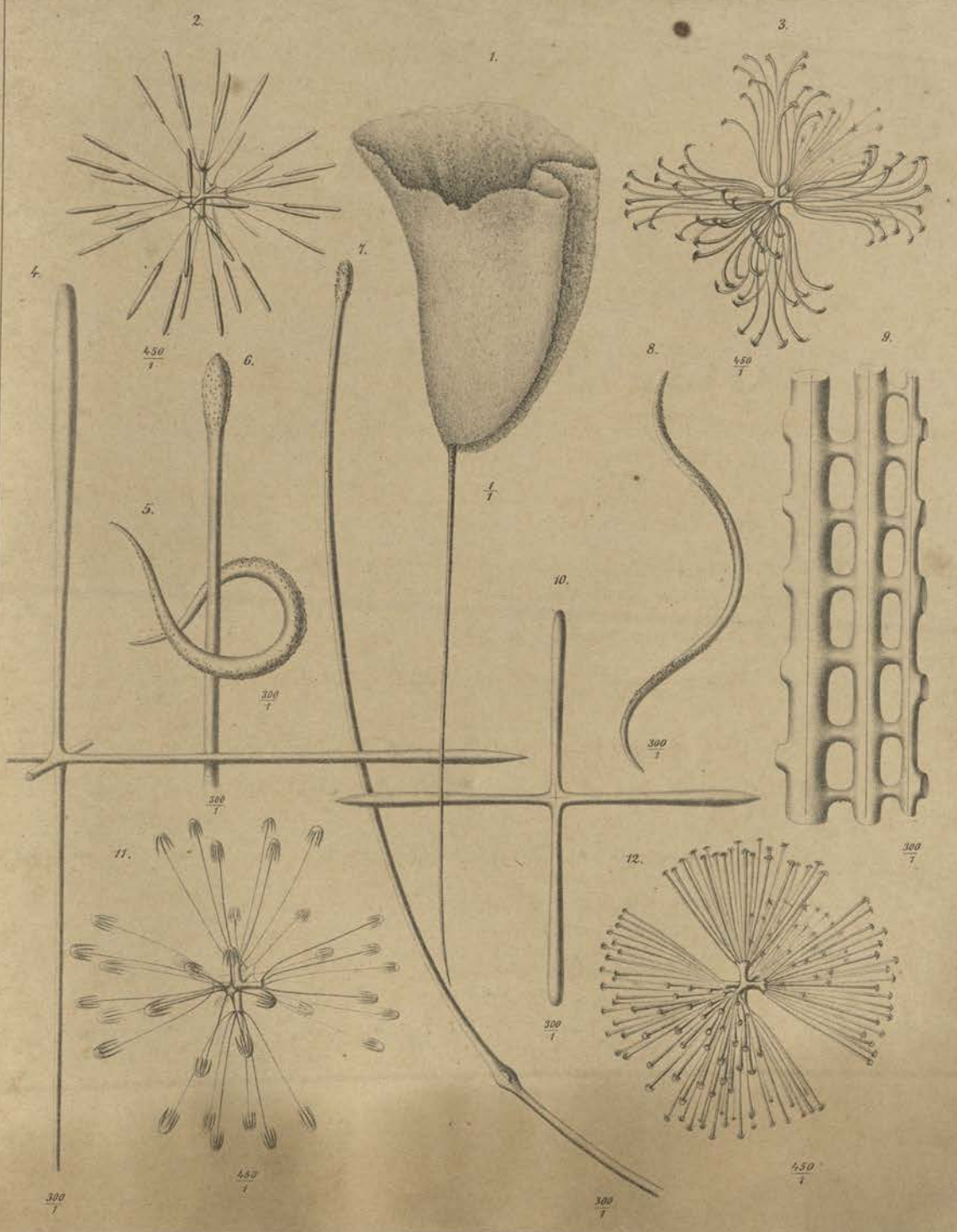
Fig. 7. Part of a long, slightly curved diact with rough club-shaped ends; × 300.

Fig. 9. Portion of the ladder-like connected longitudinal spicules of the stem; × 300.

Fig. 10. Tetract with two opposite rounded and two opposite pointed rays; × 300.

Fig. 11. Discohexaster with eight rayed, inverted, bell-shaped umbels at the ends of the terminal rays; × 450.

Fig. 12. Discohexaster with numerous long straight terminal rays; × 450.



F.E. Schulze and W. Fintsch del.

lith. Anst. v. J.G. Bach, Leipzig.

HYALOSTYLUS DIVES. F.E. Schulze.

PLATE LXXI.

PLATE LXXI.

PAGE

Farrea occa (Bowerbank), Carter, ... 277

(Erroneously named *Farrea haeckelii* on the Plate.)

Fig. 1. Lateral view of a specimen, preserved in alcohol, from a photograph; natural size.

Fig. 2. Upper view of a specimen, preserved in alcohol, from a photograph; natural size.

Fig. 3. Transverse section of the tube-wall (combination figure); × 100.

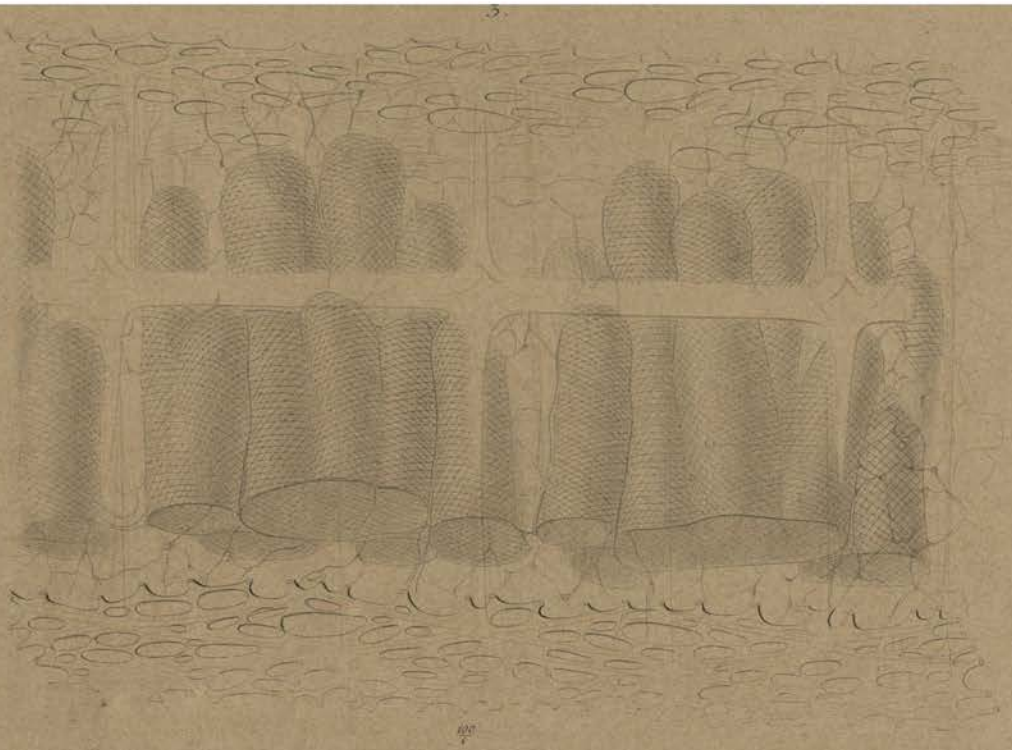
Fig. 4. Uncinatum with few bent spines; × 450.

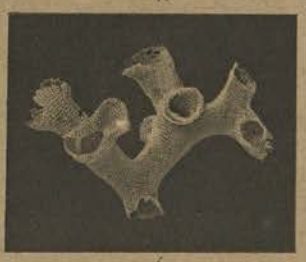
Figs. 5, 9. Dermal clavulæ with club-shaped head, hemispherically arched umbel and tuberculate stalk; × 450.

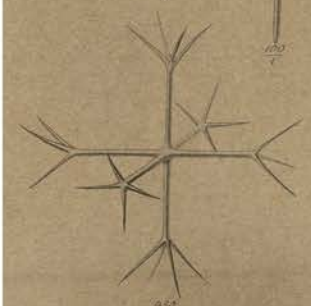
Fig. 6. Dermal pentact with somewhat inwardly bent tangential rays, tuberculate on the outer side; × 100.

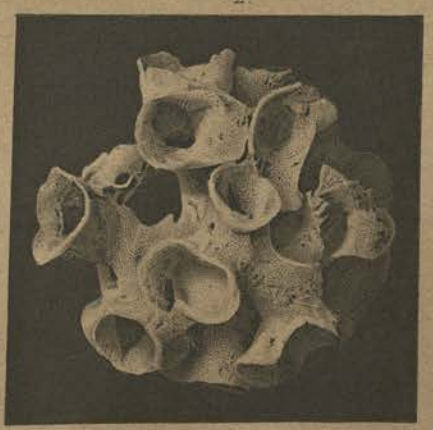
Fig. 7. Oxyhexaster with long principal, and small, divergent, terminal rays; × 450.

Figs. 8, 10. Gastral clavulæ with anchor-like six-spined head, and without roughness on the main part of the stalk; × 450.









FARREA HAECKELII. F.E.Schulze

PLATE LXXII.

PLATE LXXII.

PAGE

Farrea occa (Bowerbank), Carter, . . 277

(Erroneously named *Farrea haeckelii*, F. E. S., on the Plate.)

Fig. 1. Dry skeleton of *Farrea occa*, from a photograph; natural size.

Fig. 2. Basal portion of a small specimen, showing the aperture of an excurrent canal; natural size.

Fig. 3. Outer terminal view of the bifurcation of a tube; × 2.

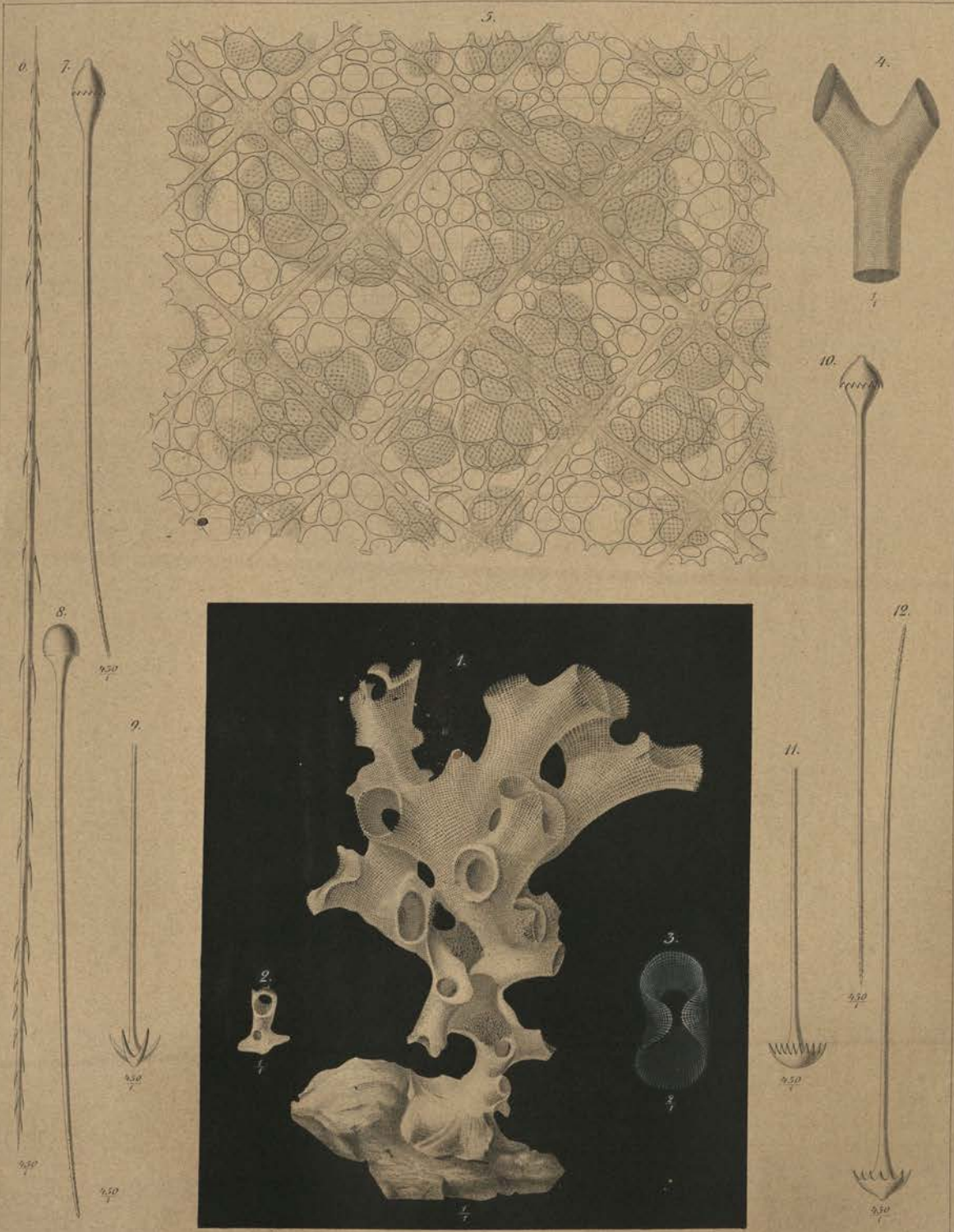
Fig. 4. Fragment of a specimen with very elongated (extended) tubes; natural size.

Fig. 5. Outer view of the dermal side of the wall (combination figure); × 100.

Fig. 6. Uncinatum with more spines than in that figured in Pl. LXXI. fig. 4.

Figs. 7, 8, 10. Dermal clavulæ with lemon-shaped or globular heads, varying from crowned ones with a toothed margin to smooth ones; × 450.

Figs. 9, 11, 12. Gastral clavulæ, anchor-like, with long teeth, or with a hemispherically arched head and much shorter teeth; × 450.



FARREA HAECKELII. F.E. Schulze.

PLATE LXXIII.

PLATE LXXIII.

PAGE

Farrea occa (Bowerbank), Carter, ... 277

(Erroneously named *Farrea haeckelii* on the Plate.)

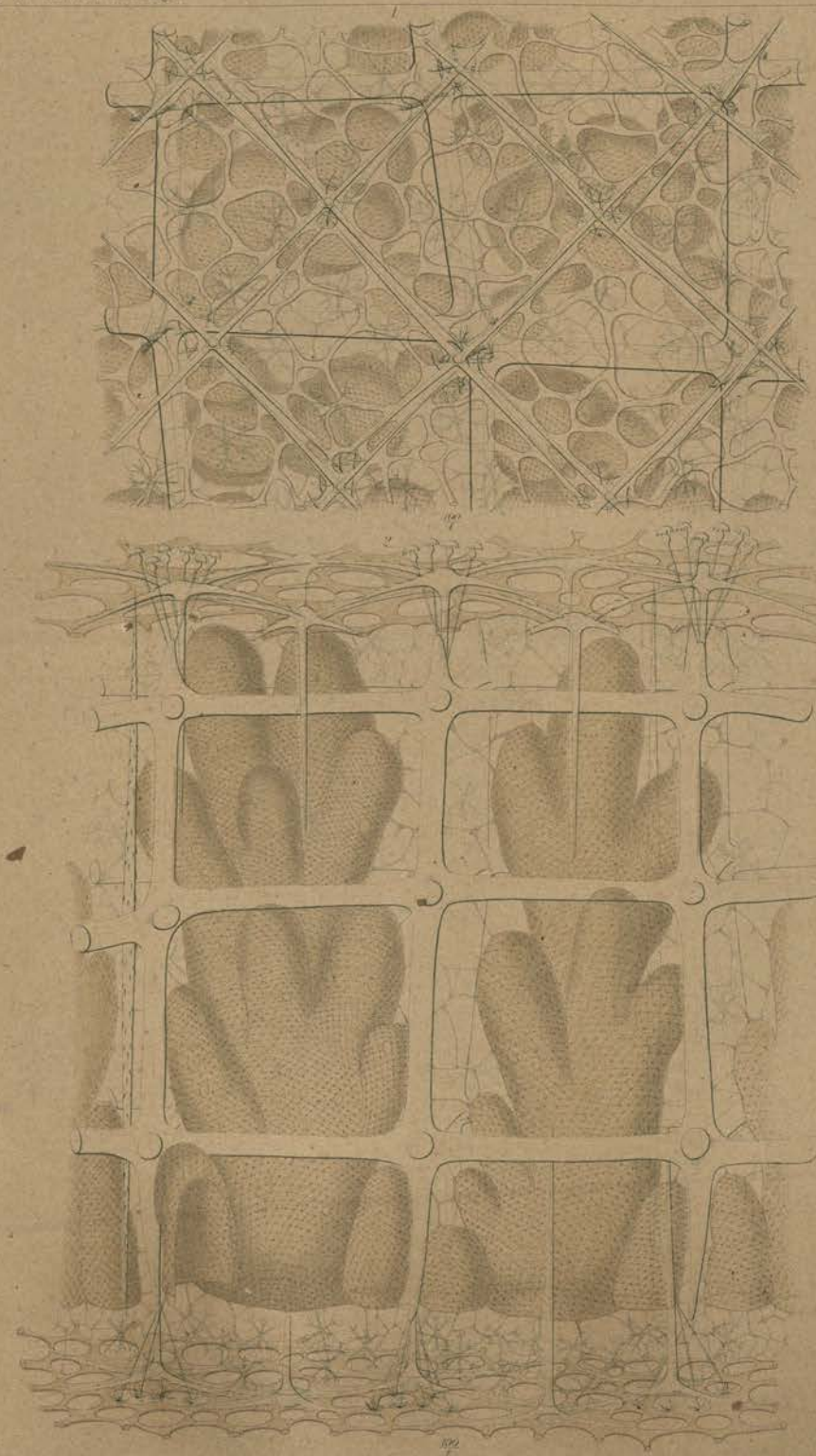
Fig. 1. Gastral view of the inner side of the tube-wall (combination figure); × 100.

Fig. 2. Transverse section of the tube-wall of the inferior part of an old specimen (combination figure); × 100.

Fig. 3. Uncinatum with very few spines; × 300.

Fig. 4. Simple oxyhexact; × 300.

Fig. 5. Exterior part of an uncinatum; × 1000.



FARREA HAECKELII. F.E. Schulze

PLATE LXXIV.

PLATE. LXXIV.

PAGE

Figs. 1–6. *Farrea sollasii*, F. E. S., . . . 286

Fig. 1. Spicules of a dry specimen in the natural situation of a transverse section of the tube-wall; × 100

Fig. 2. Uncinatum with numerous spines; × 300.

Fig. 3. Dermal clavula with hemispherical umbel of the head; × 450.

Figs. 4, 5. Gastral clavulæ with anchor teeth of various length; × 450.

Fig. 6. Discohexaster with slender terminal rays; × 450.

Figs. 7–13. *Farrea vosmaeri*, F. E. S., . . . 286

Fig. 7. Spicules of a dry specimen, in their natural situation, of a transverse section of the tube-wall; × 100.

Fig. 8. Oxyhexaster with long, strong, principal, and small, divergent, terminal rays; × 450.

Fig. 9. Discohexaster with long, strong, principal, and small, S-shaped, terminal rays, in perianth-like arrangement; × 450.

Fig. 10. Dermal clavula with flatly bent surface of the umbel of the head; × 450.

Fig. 11. Uncinatum with short spines; × 300.

Fig. 12. Gastral clavula with very long spines; × 450.

Fig. 13. Gastral clavula with flatly bent umbel, with somewhat long teeth; × 450.

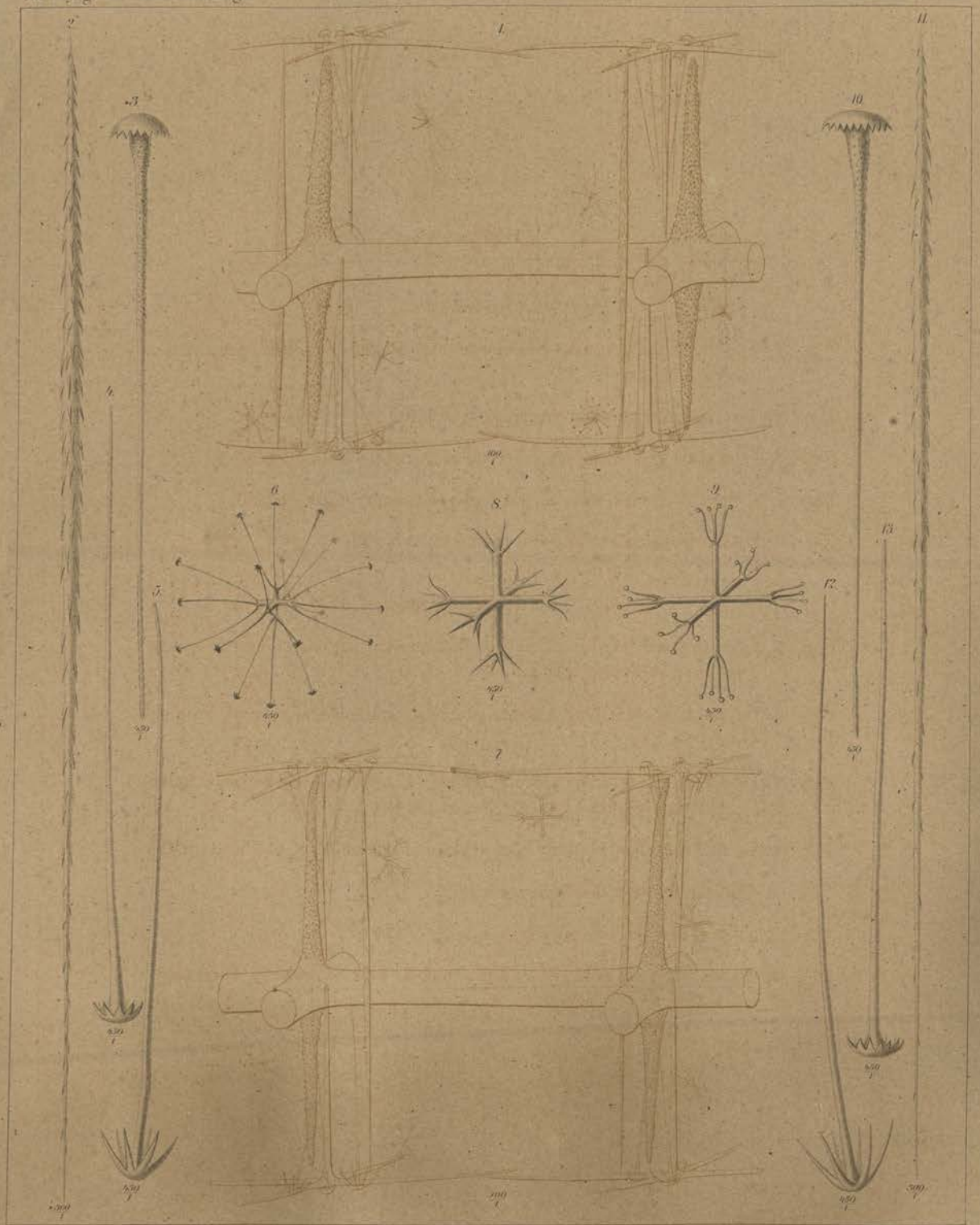


Fig. 1-6. FARREA SOLLASII. F.E.Schulze. Fig. 7-13. FARREA VOSMAERI. F.E.Schulze.

PLATE LXXV.

PLATE LXXV.

PAGE

Farrea clavigera, F. E. S., ... 287

Fig. 1. A damaged specimen, preserved in alcohol; natural size.

Fig. 2. Transverse section of the tube-wall (combination figure); × 80.

Fig. 3. Dermal clavula with rounded head, showing two parallel circles of small spines and a little knob on the top; × 450.

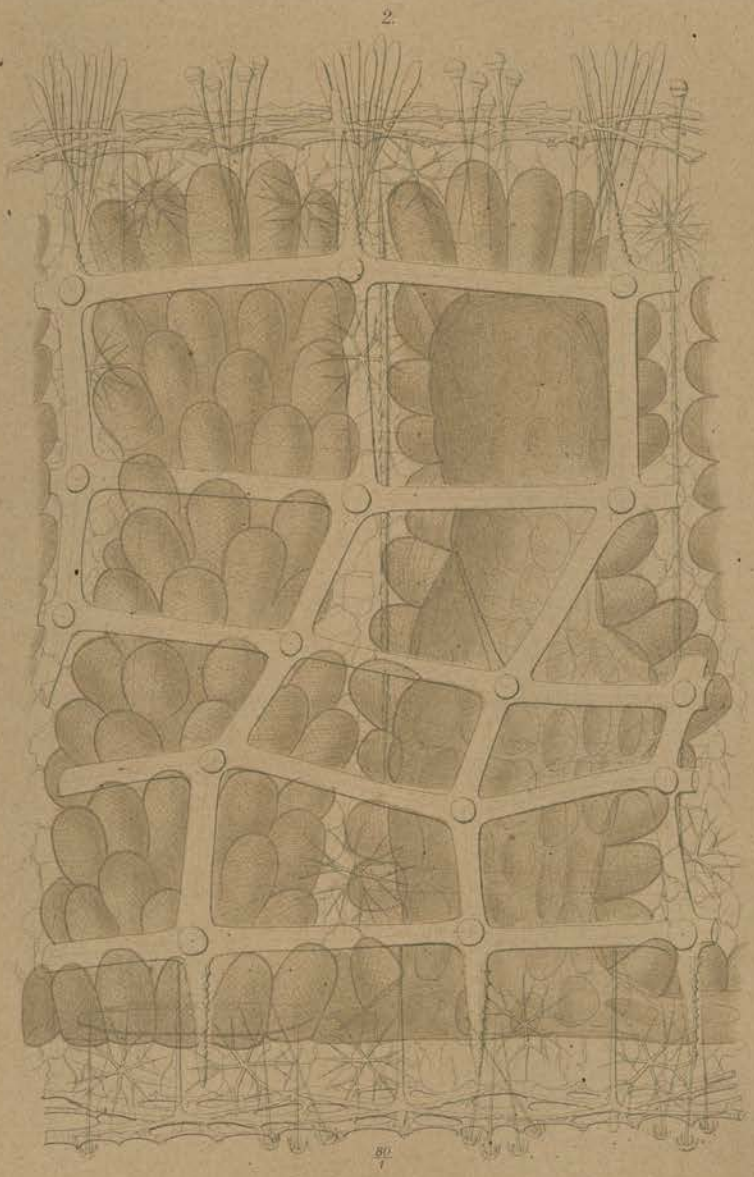
Fig. 4. Gastral clavula with four long teeth; × 450.

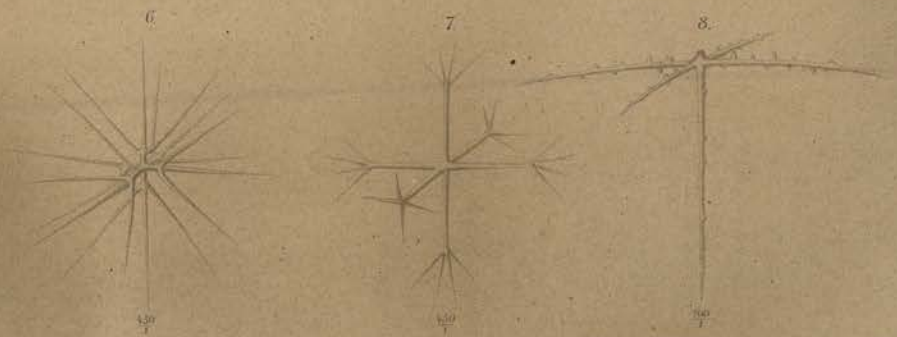
Fig. 5. Club-shaped dermal clavula with a little knob on the top; × 450.

Fig. 6. Foreign extrinsic intruded spicule, not belonging to this species.

Fig. 7. Oxyhexaster with long principal, and small terminal rays; × 450.

Fig. 8. Dermal oxypentact with knotty rays and a small distal tubercle, representing the lost sixth ray; × 100.





FARREA CLAVIGERA. F.E.Schulze.

PLATE LXXVI.

PLATE LXXVI.

PAGE

Figs. 1–3. *Farrea occa* (Bowerbank), Carter, . . 277

(Erroneously named *Farrea hæckelii* on the Plate.)

Fig. 1. Dictyonal skeleton of the marginal portion of the tube-wall; × 50.

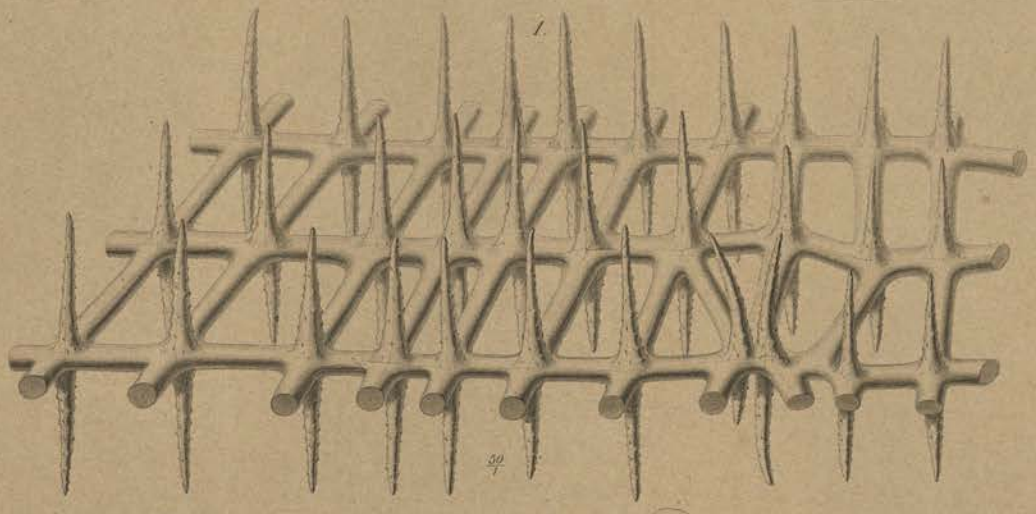
Fig. 2. Dictyonal skeleton of the basal portion (combination figure); × 50.

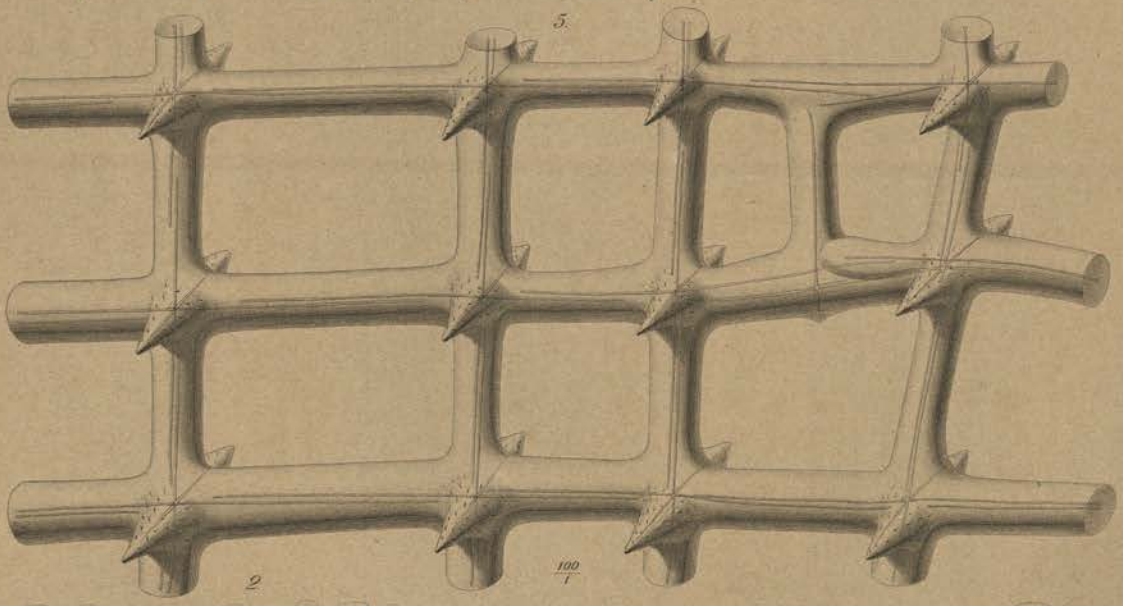
Fig. 3. Dictyonal skeleton of the middle portion; × 50.

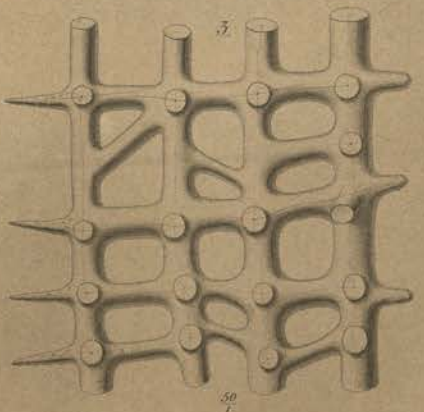
Figs. 4, 5. *Farrea* (*?*) sp., . . . 288

Fig. 4. Basal portion of the macerated dictyonal skeleton of an infundibuliform specimen; natural size.

Fig. 5. Part of the dictyonal skeleton of the specimen figured in fig. 4; × 100.







F.E. Schulze und G. Fritsch del.

Lith. Anst. v. Werner & Winter, Frankfurt a/M.

Fig. 1-3. FARREA HAECKELII. F.E. Schulze. Fig. 4 & 5. FARREA Sp.

PLATE LXXVII.

PLATE LXXVII.

PAGE

Eurete semperi, F. E. S., ... 292

Fig. 1. A specimen preserved in alcohol, with small anthozoa; natural size.

Fig. 2. Transverse section of the tube-wall; × 60.

Fig. 3. Uncinatum; × 300.

Fig. 4. Exterior part of a dermal scopula with four straight prongs; × 450.

Fig. 5. Dermal scopula with slightly bent prongs; × 450.

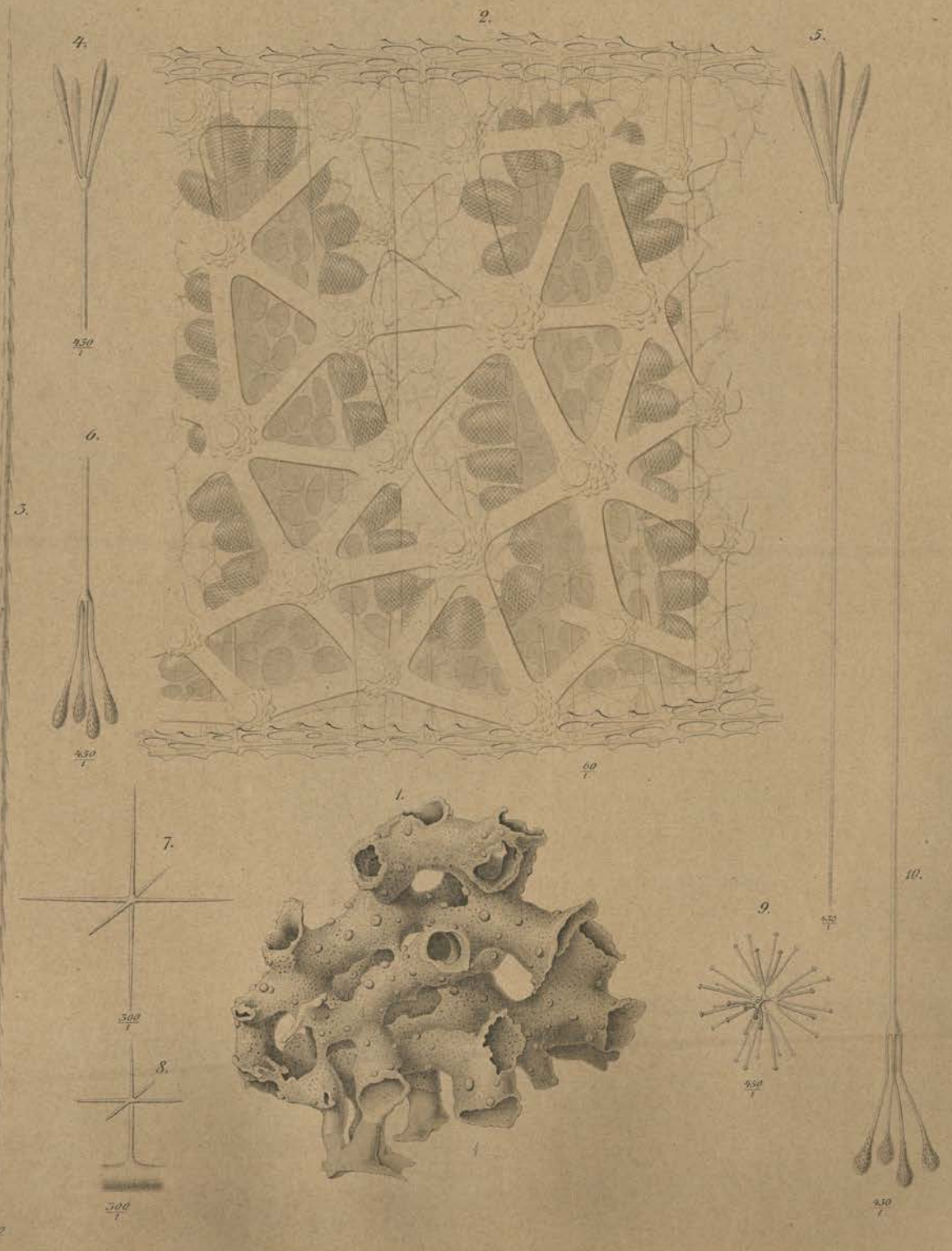
Fig. 6. Interior part of a gastral scopula with bent prongs; × 450.

Fig. 7. Simple free oxyhexact; × 300.

Fig. 8. Oxyhexact fused perpendicularly by one ray to the surface of a beam of the dictyonal framework; × 300.

Fig. 9. Small discohexaster; × 450.

Fig. 10. Gastral scopula with four prongs, whose stalks are slightly bent outwards; × 450.



F.E. Schulze and G. Pritsch del. Lith. Anst. v. Werner & Winter, Frankfurt a. M.

EURETE SEMPERI. F.E. Schulze.

PLATE LXXVIII.

PLATE LXXVIII.

PAGE

Figs. 1–6. *Eurete schmidtii*, F. E. S., . . . 293

Fig. 1. A specimen preserved in alcohol; natural size.

Fig. 2. Transverse section of the tube-wall (combination figure); × 60.

Fig. 3. Dermal scopula with four pointed prongs (teeth); × 450.

Fig. 4. Gastral scopula with four knobbed prongs; × 450.

Fig. 5. Dermal scopula with two pointed prongs; × 450.

Fig. 6. Oxyhexaster; × 450.

Figs. 7–12. *Eurete carteri*, F. E. S., . . . 296

Fig. 7. A specimen preserved in alcohol; natural size.

Fig. 8. Transverse section of the tube-wall (combination figure); × 60.

Fig. 9. Dermal scopula with knobbed prongs; × 450.

Fig. 10. Gastral scopula with knobbed prongs; × 450.

Fig. 11. Discohexaster with S-shaped terminal rays, in perianth-like arrangement; × 450.

Fig. 12. Discohexaster with irregularly bent terminal rays; × 450.

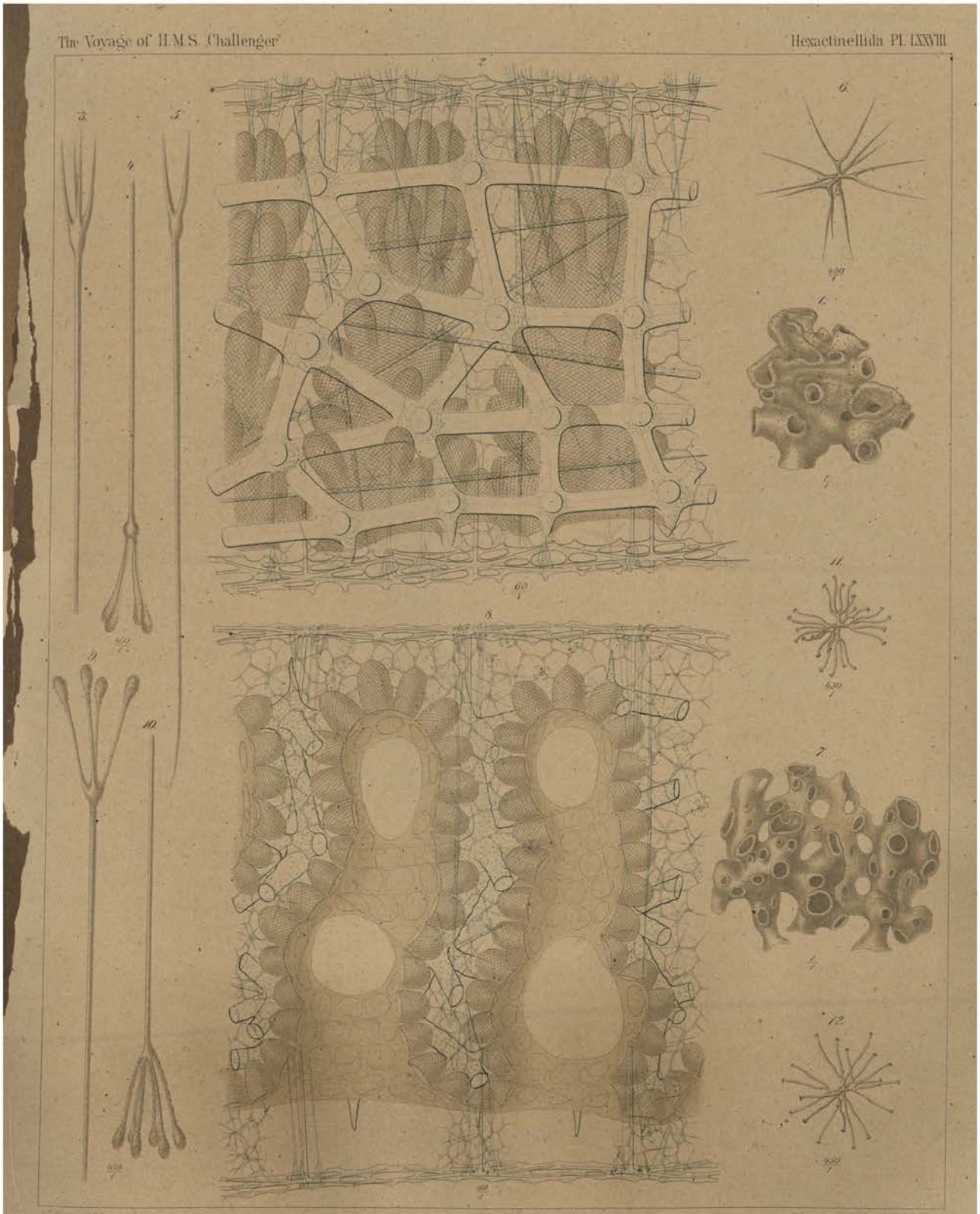


Fig 1-6. EURETE SCHMIDTII F.E.Schulze. Fig. 7-12. EURETE CARTERI. F.E.Schulze.

PLATE LXXIX.

PLATE LXXIX.

PAGE

Figs. 1–4. *Eurete marshalli*, F. E. S., ... 297

Fig. 1. A specimen, preserved in alcohol; natural size.,

Fig. 2. Transverse section of the tube-wall, showing the dictyonal skeleton and loose spicules in their natural position; × 50.

Fig. 3. Oxyhexaster; × 300.

Fig. 4. Dermal scopula with knobbed prongs; × 300.

Figs. 5–8. *Eurete farreopsis*, Carter, . . . 295

Fig. 5. A specimen, preserved in alcohol; natural size.

Fig. 6. Transverse section of the tube-wall, showing the dictyonal skeleton and loose spicules in their natural position; × 50.

Fig. 7. Discohexaster with knob-like terminal discs; × 300.

Fig. 8. Dermal scopula with a break-like bend of the knobbed prongs; × 300.

Figs. 9–13. *Eurete bowerbankii*, F. E. S., . . . 297

Fig. 9. A specimen, preserved in alcohol; natural size.

Fig. 10. Transverse section of the tube-wall, showing the dictyonal framework and loose spicules in their natural position; × 50.

Figs. 11, 12. Dermal scopulæ with straight, knobbed prongs; × 300.

Fig. 13. Oxyhexaster with long principal and short divergent terminal rays; × 300.

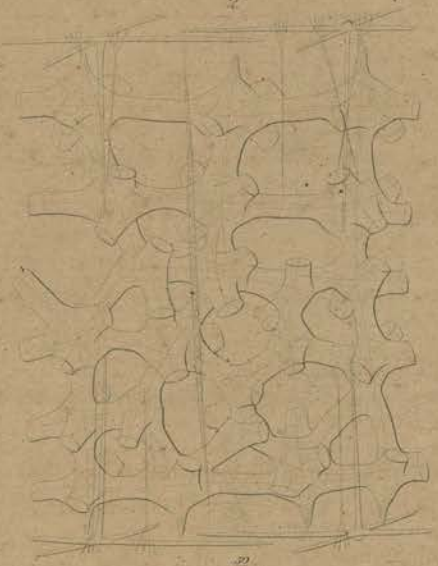


Fig. 1-4. EURETE MARSHALLI. F. E. Schulze. Fig. 5-8. EURETE FARREOPSIS. H. J. Carter. Fig. 9-13. EURETE BOWERBANKII. F. E. Schulze.

PLATE LXXX.

PLATE LXXX.

PAGE

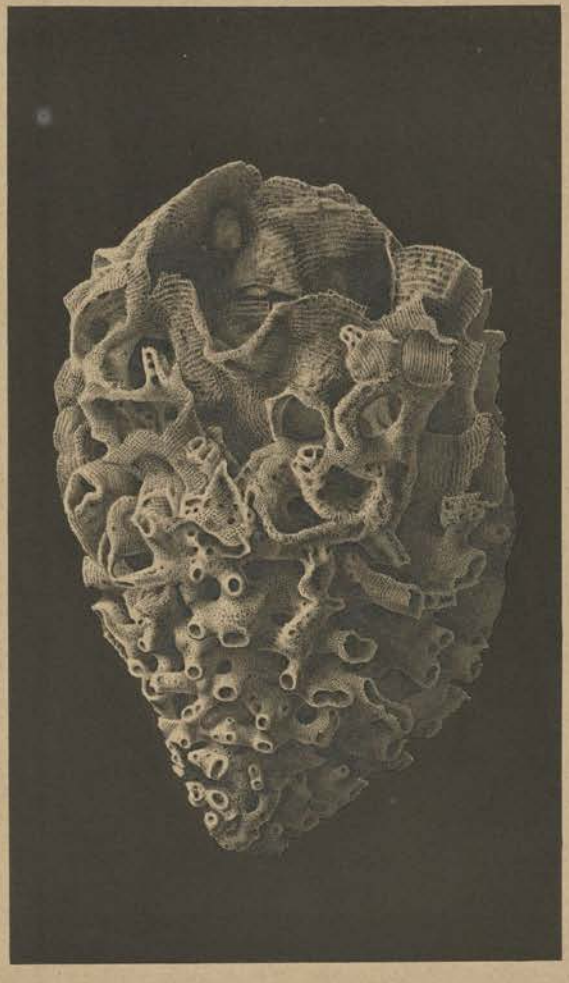
Periphragella elisæ, Marshall, . . 299

Fig. 1. Macerated dictyonal skeleton of a bent specimen, from a photograph; natural size.

Fig. 2. Macerated dictyonal skeleton of a straight specimen, from a photograph; natural size.

1.

2.



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PERIPHRAGELLA ELISAE. W. Marshall.

PLATE LXXXI.

PLATE LXXXI.

PAGE

Periphragella elisæ, Marshall, . . 299

Fig. 1. A fragment, preserved in alcohol; natural size.

Fig. 2. Transverse section of the wall (combination figure); × 50.

Fig. 3. Dermal scopula with straight knobbed prongs and shaft; × 300.

Fig. 4. Discohexaster; × 300.

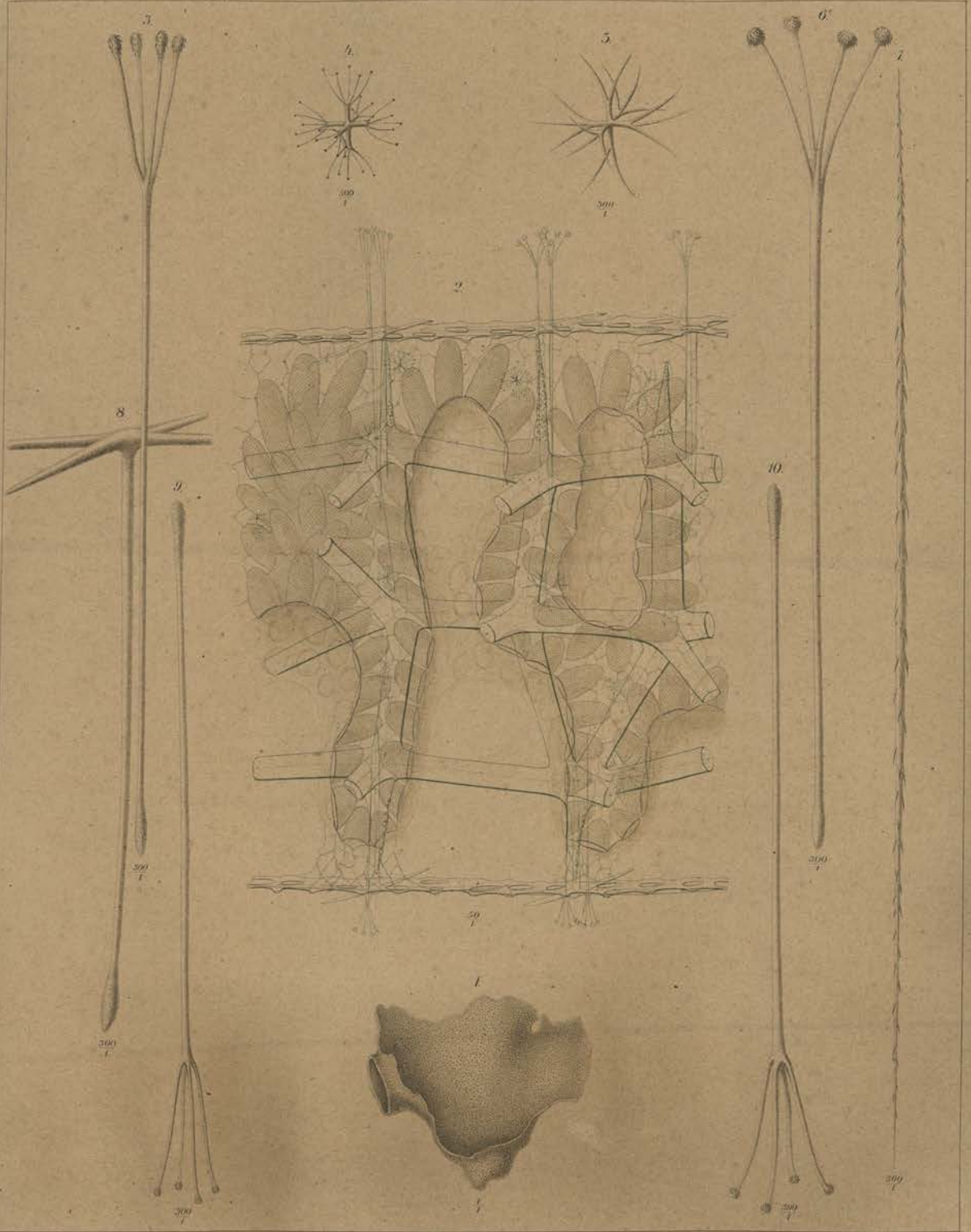
Fig. 5. Oxyhexaster with divergent terminal rays; × 300.

Fig. 6. Dermal scopula with divergent knobbed prongs; × 300.

Fig. 7. Small uncinatum; × 300.

Fig. 8. Dermal pentact, whose radial ray ends in a club-shaped swelling; × 8.

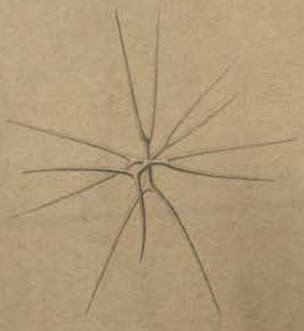
Figs. 9, 10. Gastral scopulæ with S-shaped prongs and a club-shaped swelling at the end of the shaft; × 300.

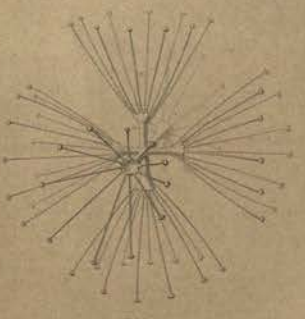


PERIRHRAGELLA ELISAE. W. Marshall.

PLATE LXXXII.

PLATE LXXXII.





E. E. Schulze and G. Fritsch del.

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LEFROYELLA DECORA. Wyville Thomson.

PLATE LXXXIII.

PLATE LXXXIII.

PAGE

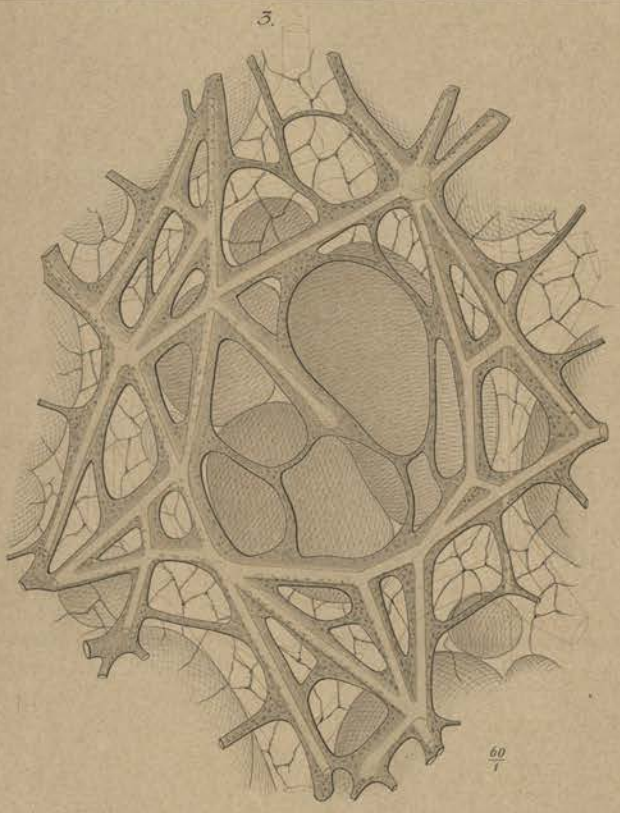
Aphrocallistes bocagei, Wright, ... 313

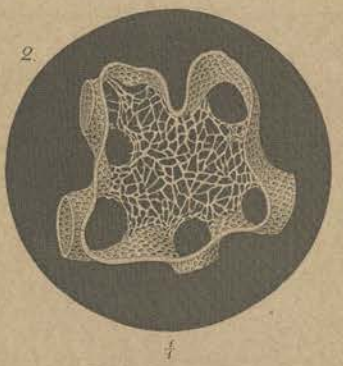
Fig. 1. A specimen, preserved in alcohol; natural size.

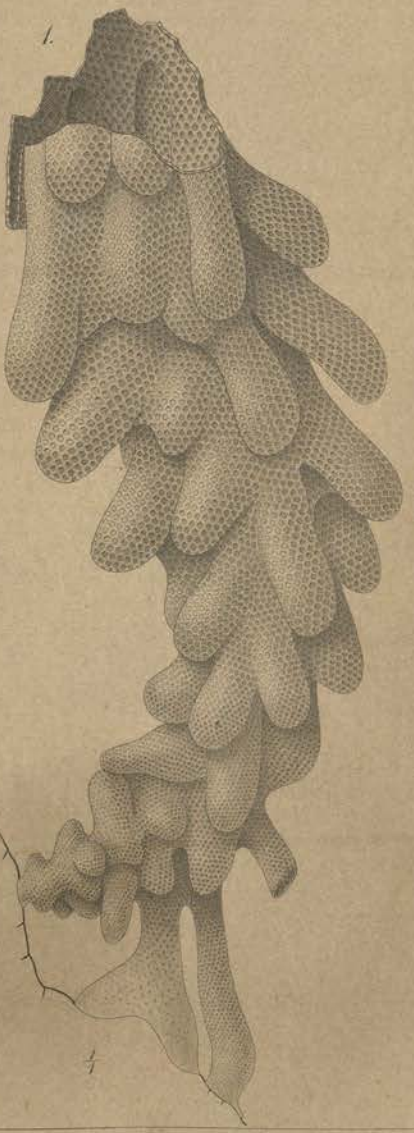
Fig. 2. Upper view of an internal diaphragma fixed to the wall; natural size.

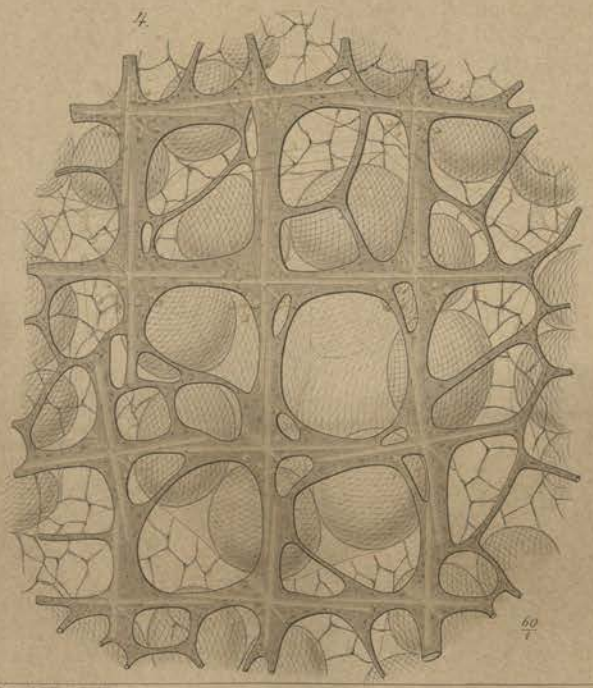
Fig. 3. Inner view of the gastral surface of the wall; × 60.

Fig. 4. Outer view of the dermal surface of the wall; × 60.









E.E. Schulze und F. Pfitzner del.

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APHROCALLISTES BOCCAGEI. Perc. Wright.

PLATE LXXXIV.

PLATE LXXXIV.

Figs. 1–8. *Aphrocallistes bocagei*, Wright, . . PAGE 313

Fig. 1. Transverse section of the wall; × 60.

Fig. 2. An uncinatum; × 300.

Fig. 3. Dermal scopula with long, knobbed prongs; × 450.

Fig. 4. Dermal scopula with knobbed prongs of usual length; × 450.

Fig. 5. Dermal scopula with long, divergent, pointed prongs; × 450.

Fig. 6. Oxyhexaster with rays of equal length; × 450.

Fig. 7. Oxyhexaster, one of whose axes is somewhat longer than the other two; × 450.

Fig. 8. Dermal hexact pinulus; × 450.

Figs. 9, 10. *Aphrocallistes beatrix*, Gray, . . 311

Fig. 9. Oxyhexaster with two elongated, smooth, principal rays on one axis, and simple pointed rays on the other two; × 450.

Fig. 10. Oxyhexaster with two very long, echinated, principal rays on the one axis, and simple pointed rays on the other two; × 450.

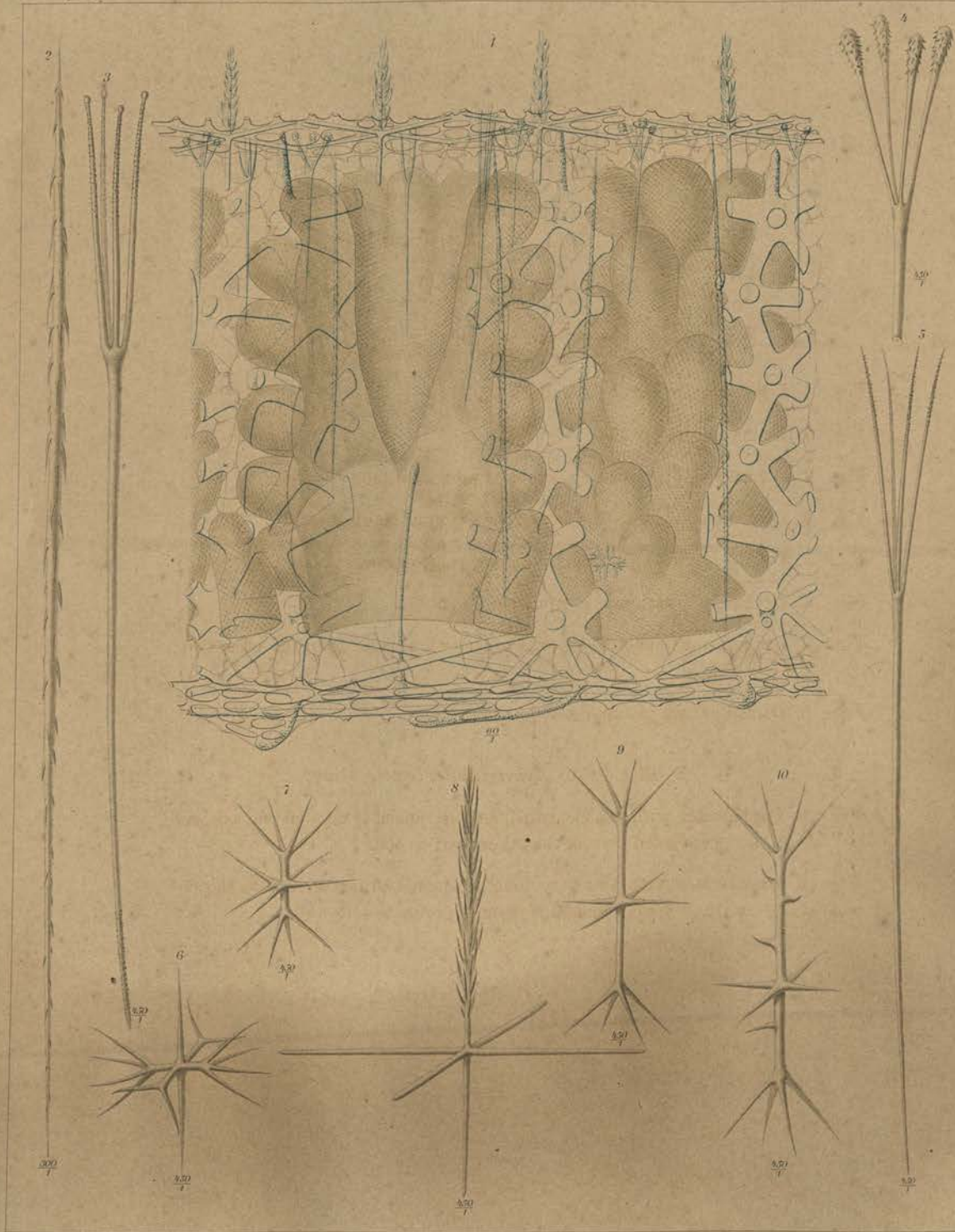


Fig. 1–8. APHROCALLISTES BOCAGEI. P. Wright. Fig. 9 and 10. APHROCALLISTES BEATRIX. J. E. Gray.

PLATE LXXXV.

PLATE LXXXV.

PAGE

Aphrocallistes vastus, F. E. S., ... 317

Fig. 1. Fragment of a dry specimen, from a photograph; natural size.

Fig. 2. Long uncinatum; × 100.

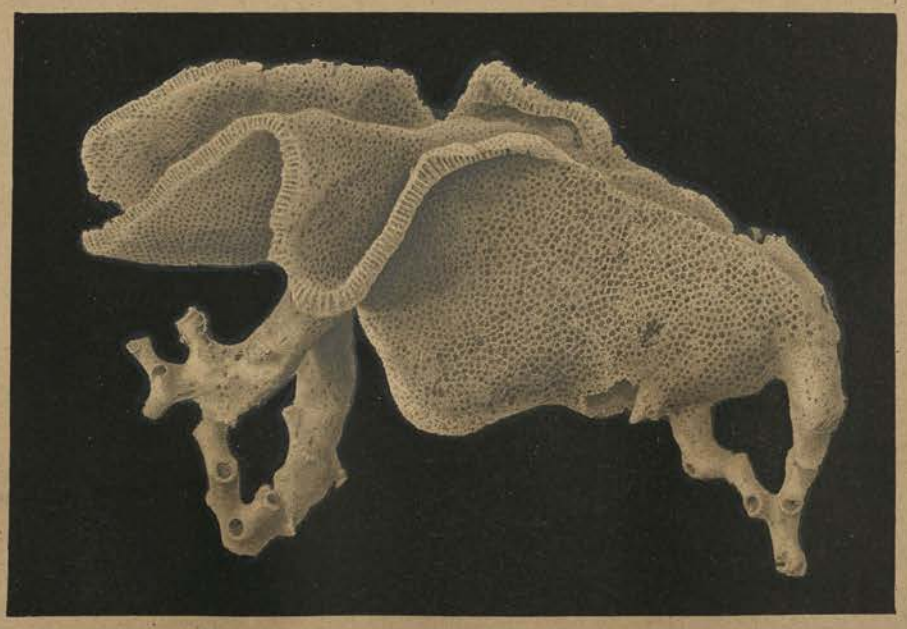
Figs. 3, 5, 8, 9. Discohexasters of various sizes; × 450.

Fig. 4. Dermal hexact pinulus; × 300.

Fig. 6. Parenchymal rough diact with central thickening; × 300.

Fig. 7. Dermal scopula with two simple unknobbed prongs; × 300.

Fig. 10. Parenchymal rough monact with a terminal thickening; × 300.



APHROCALLISTES VASTUS. F.E. Schulze.

PLATE LXXXVI.

PLATE LXXXVI.

PAGE

Aphrocallistes ramosus, F. E. S., ... 319

Fig. 1. A specimen preserved in alcohol, from a photograph ; natural size.

Fig. 2. Transverse section of the wall (combination figure) ; × 50.

Fig. 3. Dermal pentact with a knob-like rudiment on the sixth (distal) ray ; × 300.

Fig. 4. Dermal hexact with club-like pronged distal ray ; × 300.

Fig. 5. Dermal scopula with geniculate knobbed prongs ; × 300.

Fig. 6. Oxyhexaster whose principal rays in one axis are somewhat longer than the others ; × 450.

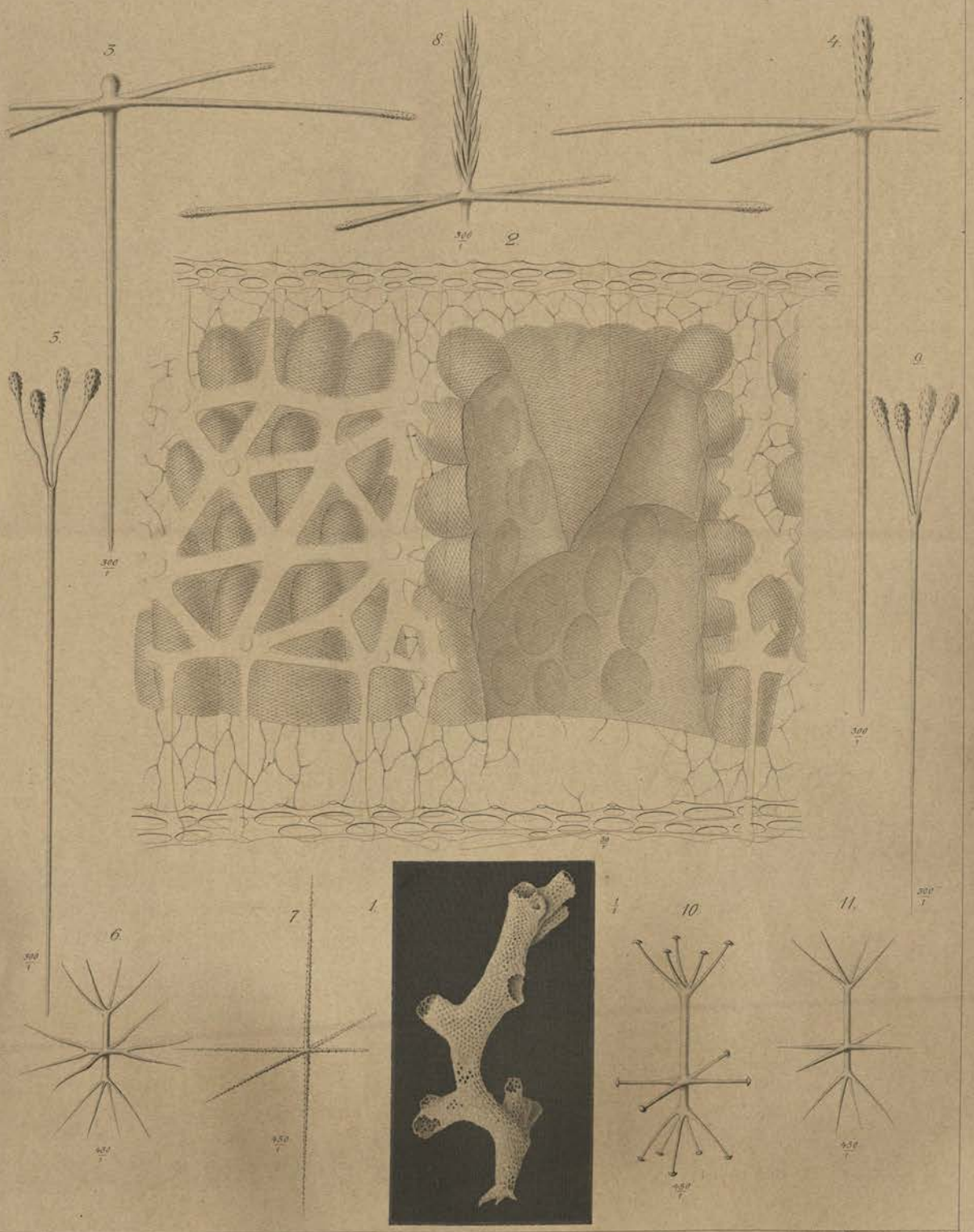
Fig. 7. Simple oxyhexact with rough pointed rays ; × 450.

Fig. 8. Dermal hexact pinulus ; × 300.

Fig. 9. Dermal scopula with straight knobbed prongs ; × 300.

Fig. 10. Discohexaster with one elongated axis, whose principal rays are of unequal lengths, while the other four short rays are undivided ; × 450.

Fig. 11. Oxyhexaster with one elongated axis, whose principal rays are of unequal lengths, while the other four short rays are undivided ; × 450.



F.E. Schulze and O. Firbach del.

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APHROCALLISTES RAMOSUS. F.E. Schulze.

PLATE LXXXVII.

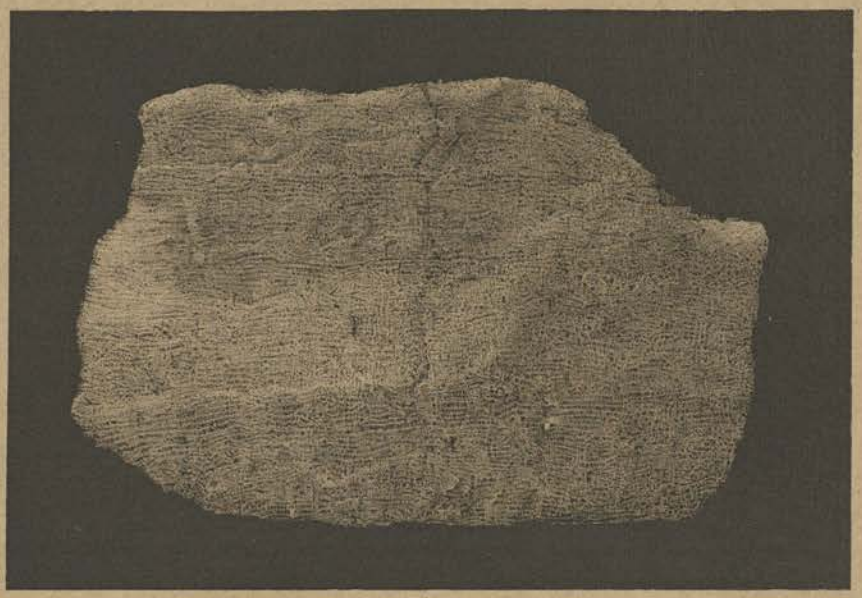
PLATE LXXXVII.

PAGE

Chonelasma lamella, F. E. S., ... 321

Figs. 1, 2. The two sides of the macerated dictyonal framework of a fragment, from a photograph; natural size.

1.



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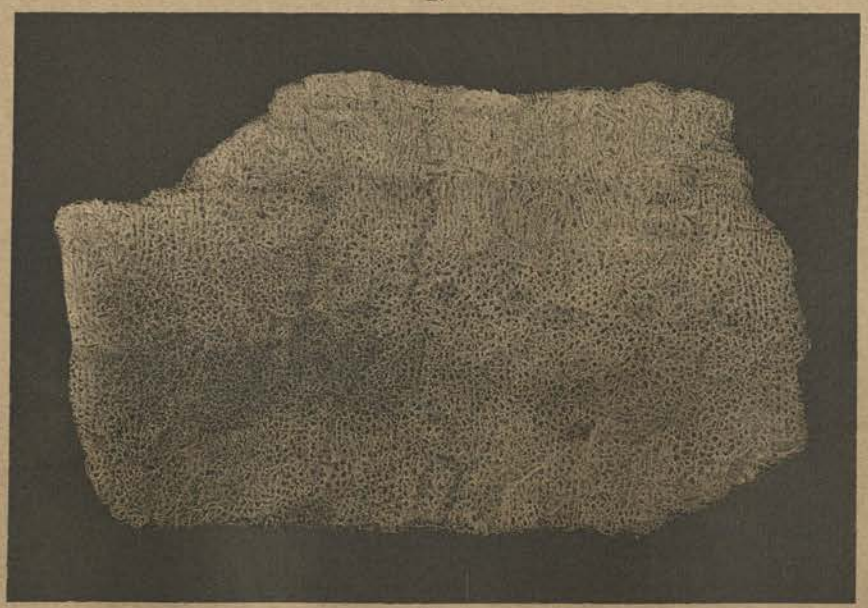

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CHONELASMA LAMELLA. F.E. Schulze.

PLATE LXXXVIII.

PLATE LXXXVIII.

PAGE

Chonelasma lamella, F. E. S., ... 321

Fig. 1. Transverse section of a flat specimen preserved in alcohol (combination figure); × 40.

Fig. 2. Section, parallel to the surface, of a specimen preserved in alcohol; × 40.

Fig. 3. Dermal pentact with echinated rays; × 300.

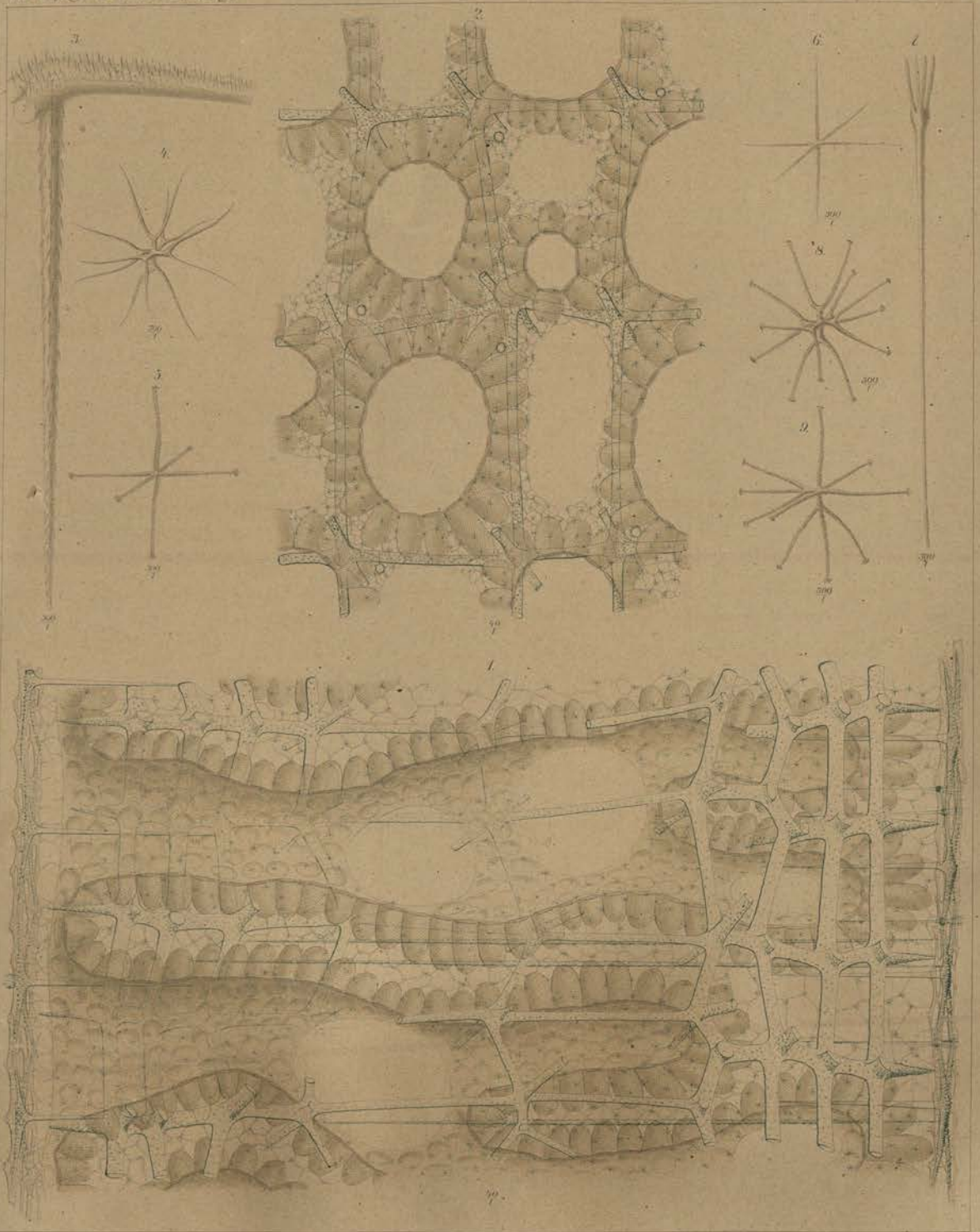
Fig. 4. Oxyhexaster with long S-shaped terminal rays; × 300.

Fig. 5. Discohexact with rough rays; × 300.

Fig. 6. Oxyhexact with rough rays; × 300.

Fig. 7. Dermal scopula with short unknobbed prongs; × 300.

Figs. 8, 9. Discohexasters with long rough terminal rays; × 300.



CHONELASMA LAMELLA. F.E.Schulze.

LIBRARY OF THE ROYAL ASIATIC SOCIETY BOMBAY BRANCH

PLATE LXXXIX.

PLATE LXXXIX.

PAGE

Chonelasma calyx, F. E. S., ... 326

Fig. 1. Lateral view of a dried specimen, from a photograph; natural size.

Fig. 2. Superior view of the same specimen shown in fig. 1, from a photograph; natural size.

Fig. 3. Uncinatum; × 200.

Fig. 4. Gastral scopula with S-shaped, barbed, unknobbed prongs; × 300.

Fig. 5. Part of a dermal pinulus-like hexact; × 300.

Fig. 6. Dermal scopula, with six straight, barbed, unknobbed prongs: × 300.

F.E. Schulze and O. Fritsch del.

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CHONELASMA CALYX. F.E. Schulze.

PLATE XC.

PLATE XC.

PAGE

Figs. 1–7. *Chonelasma dœderleinii*, F. E. S., 324

Fig. 1. A specimen preserved in alcohol, from a photograph; natural size.

Fig. 2. Transverse section of the body (combination figure); × 50.

Fig. 3. Part of a dermal hexact pinulus; × 300.

Fig. 4. Uncinatum; × 100.

Figs. 5, 6. Dermal scopulæ with barbed unknobbed prongs; × 300.

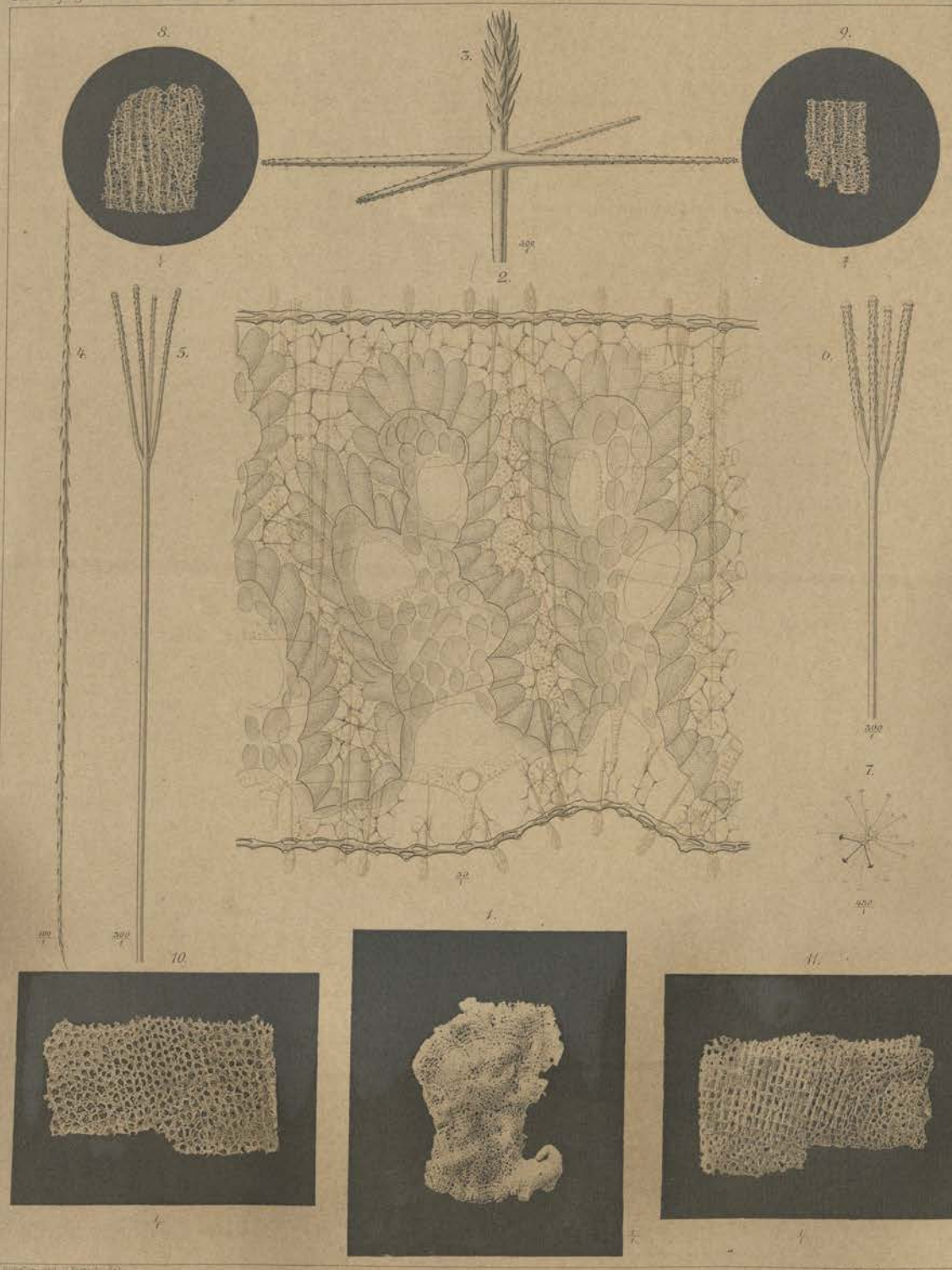
Fig. 7. Small discohexaster; × 450.

Figs. 8–11. *Chonelasma* sp., . . . 326

Fig. 8. Transverse section of a thick fragment; natural size.

Fig. 9. Cross section of another macerated specimen; natural size.

Figs. 10, 11. The two sides of a thick fragment, from photographs; natural size.



F. E. Schulze und G. Fritsche del.

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Fig. 1-7 CHONELASMA DOEDERLEINII. F. E. Schulze. Fig. 8. CHONELASMA sp. Fig. 9-11. CHONELASMA sp.

PLATE XCI.

PLATE XCI.

PAGE

Chonelasma hamatum, F. E. S., . . . 323

Fig. 1. A specimen, preserved in alcohol, natural size.

Fig. 2. Transverse section of the plain body (combination figure); × 50.

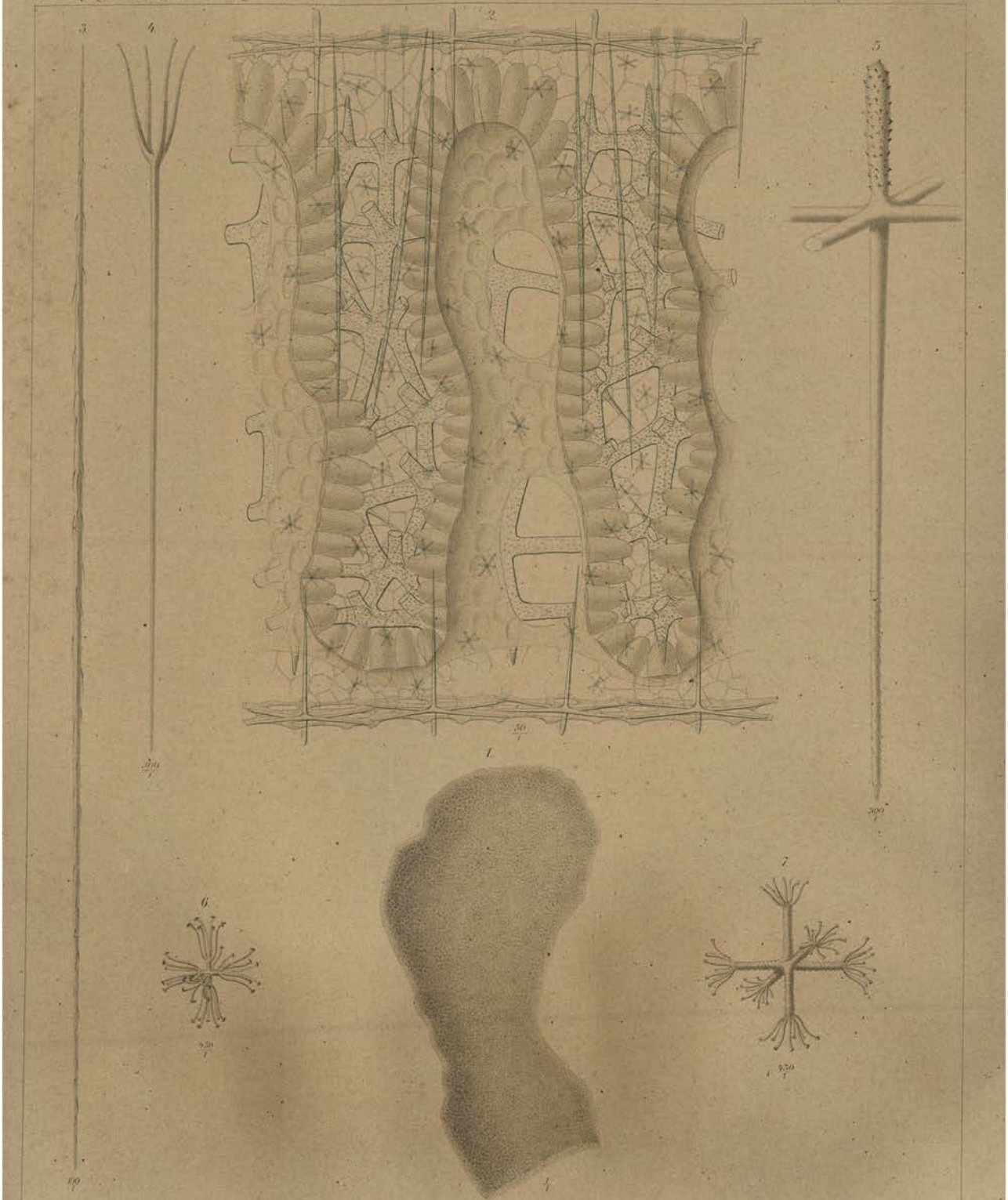
Fig. 3. Uncinatum; × 100.

Fig. 4. Dermal scopula with S-shaped knobbed prongs; × 300.

Fig. 5. Part of a dermal hexact, whose short distal ray is beset with small tubercles; × 300.

Fig. 6. Small discohexact with short principal and long S-shaped terminal rays; × 450.

Fig. 7. Discohexact with long, rough, principal, and short S-shaped terminal rays; × 450.



CHONELASMA HAMATUM F.E. Schulze.

PLATE XCII.

PLATE XCII.

PAGE

Figs. 1–8. *Cyrtaulon solutus*, F. E. S., ... 333

Fig. 1. A dried specimen in the tubular cavity of a piece of limestone; natural size.

Fig. 2. Transverse section of a broad flat beam of the body, showing the dictyonal framework and the loose spicules in their natural position; × 50.

Fig. 3. Small uncinatum; × 450.

Fig. 4. Hexaster-like spicule with a long stalk; × 300.

Fig. 5. Dermal scopula with four strong, barbed, unknobbed prongs; × 300.

Fig. 6. Dermal scopula with six small, slight, knobbed prongs; × 300.

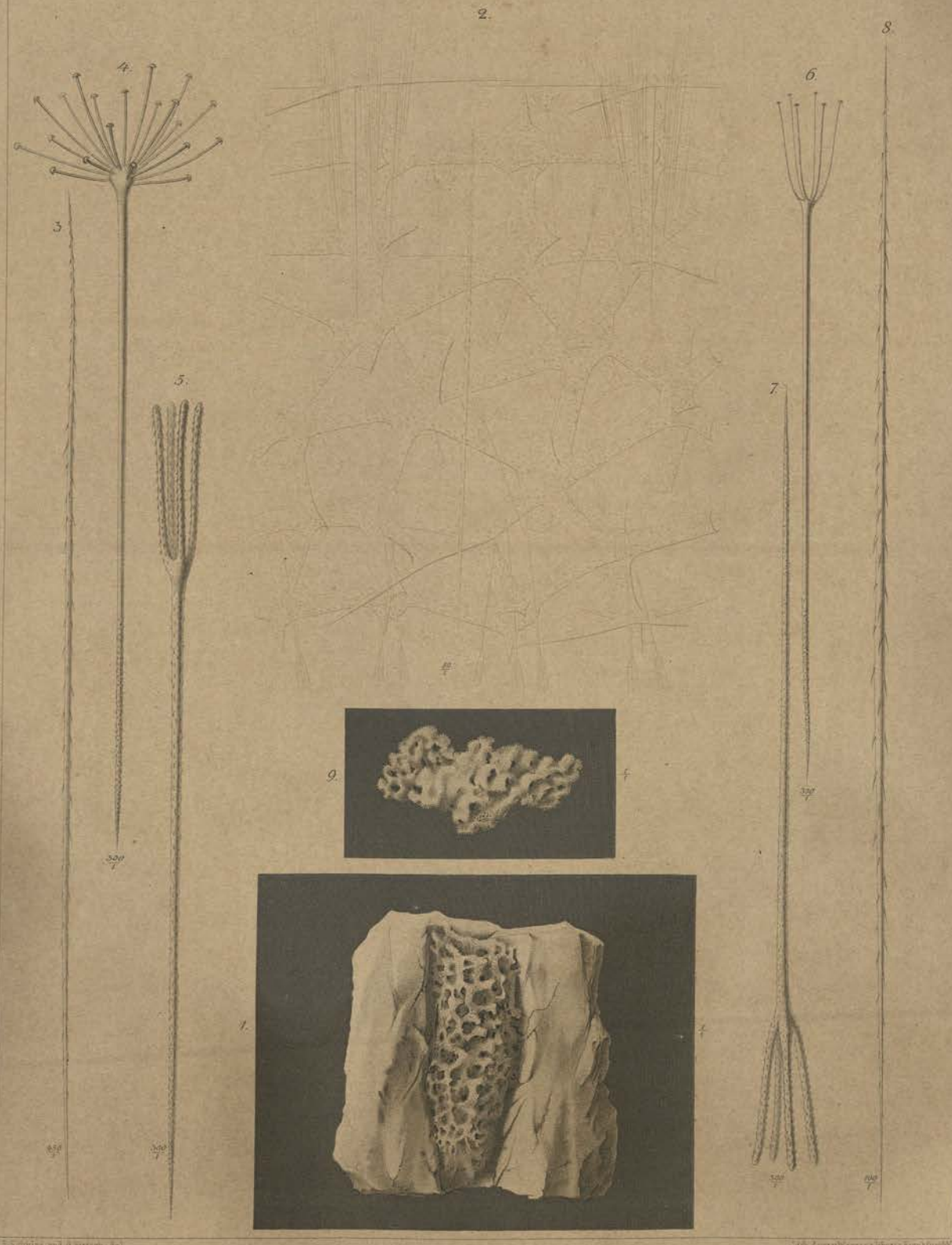
Fig. 7. Gastral scopula with four strong, barbed, unknobbed prongs; × 300.

Fig. 8. Uncinatum; × 100.

Fig. 9. *Cyrtaulon sigsbeei*, O. Schmidt, ... 333

Fig. 9. Macerated fragment, from a photograph; natural size.

The old generic name *Volvulina*, O. Schmidt, which was applied to a Gastropod in 1865, was erroneously retained on the Plate.



F.E.Schulze and G.Fritsch del.

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Fig. 1-8 VOLVULINA SOLUTA. F.E.Schulze. Fig. 9. VOLVULINA SIGSBEEI. Oscar Schmidt.

PLATE XCIII.

PLATE XCIII.

PAGE

Hexactinella tubulosa, F. E. S., ... 328

Fig. 1. A dried specimen, from a photograph ; natural size.

Fig. 2. Transverse section of the tube wall without the soft parts ; × 30.

Fig. 3. Small uncinatum ; × 450.

Fig. 4. Dermal scopula with four strong, barbed, unknobbed prongs ; × 300.

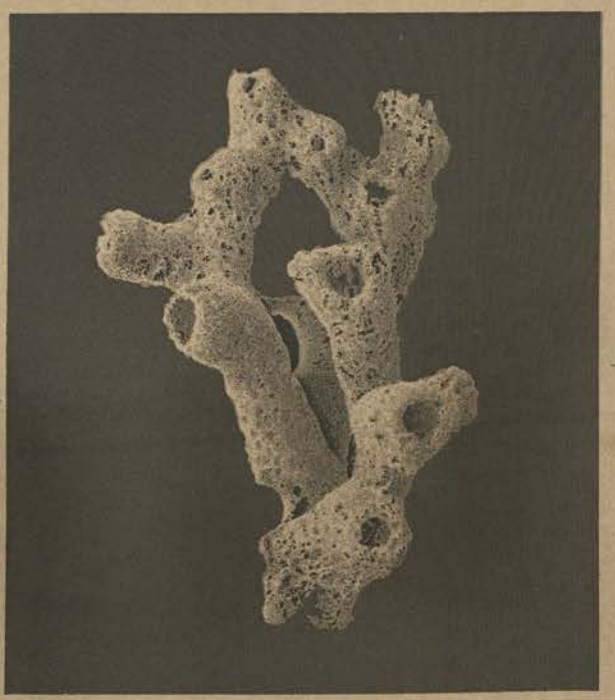
Fig. 5. Gastral scopula with four strong, barbed, unknobbed prongs ; × 300.

Fig. 6. Small smooth oxydiact ; × 450.

Fig. 7. Oxyhexaster with somewhat long principal rays ; × 450.

Fig. 8. Simple oxyhexact with rough rays ; × 450.

The generic name "*Tretodictyum*" was printed off on the Plate before the publication of Carter's description of his genus *Hexactinella*, to which I now refer this species.



F.E. Schulze and O. Fintsch del.

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TRETODICTYUM TUBULOSUM. F.E. Schulze.

PLATE XCIV.

PLATE XCIV.

PAGE

Hexactinella lata, F. E. S., . . 329

Fig. 1. A specimen preserved in alcohol; natural size.

Fig. 2. Macerated dictyonal skeleton (framework) of a fragment, from a photograph; natural size.

Fig. 3. Transverse section of a tube; natural size.

Fig. 4. Uncinatum; × 300.

Fig. 5. Dermal scopula with six geniculate knobbed prongs; × 300.

Figs. 6, 7. Sphærohexasters; × 450.

Fig. 8. Dermal scopula with four straight knobbed prongs; × 300.

Fig. 9. Dermal scopula with four straight pointed prongs; × 300.

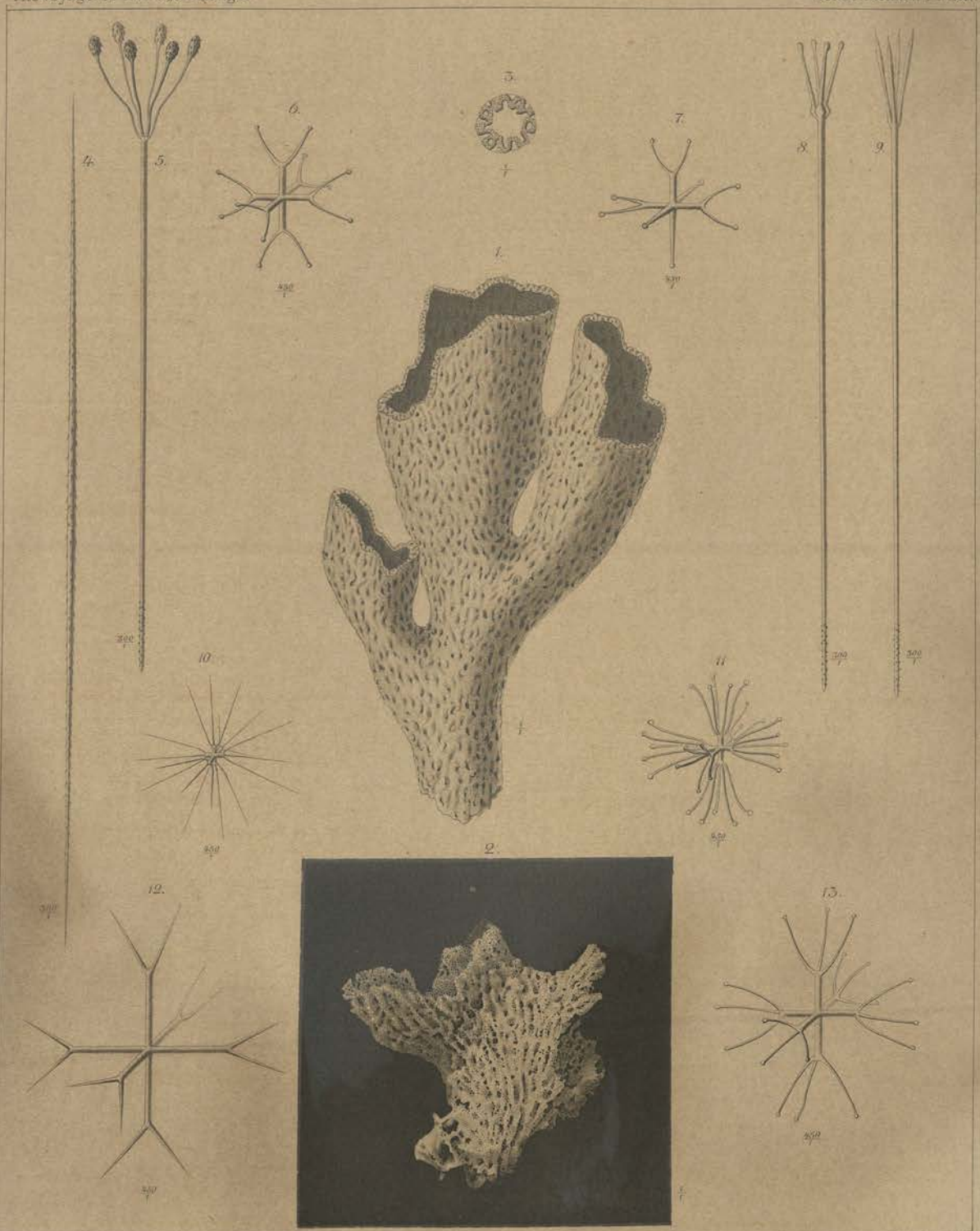
Fig. 10. Oyhexaster with straight, slender, terminal rays; × 450.

Fig. 11. Sphærohexaster with S-shaped terminal rays; × 450.

Fig. 12. Oxyhexaster with long principal rays; × 450.

Fig. 13. Sphærohexaster with middle-sized principal rays; × 450.

For "*Tretodictyum latum*" on the Plate read "*Hexactinella lata*"; see note on last Plate.



F.E. Schulze und G. Pietsch del.

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TRETODICTYUM LATUM. F.E. Schulze

PLATE XCV.

PLATE XCV.

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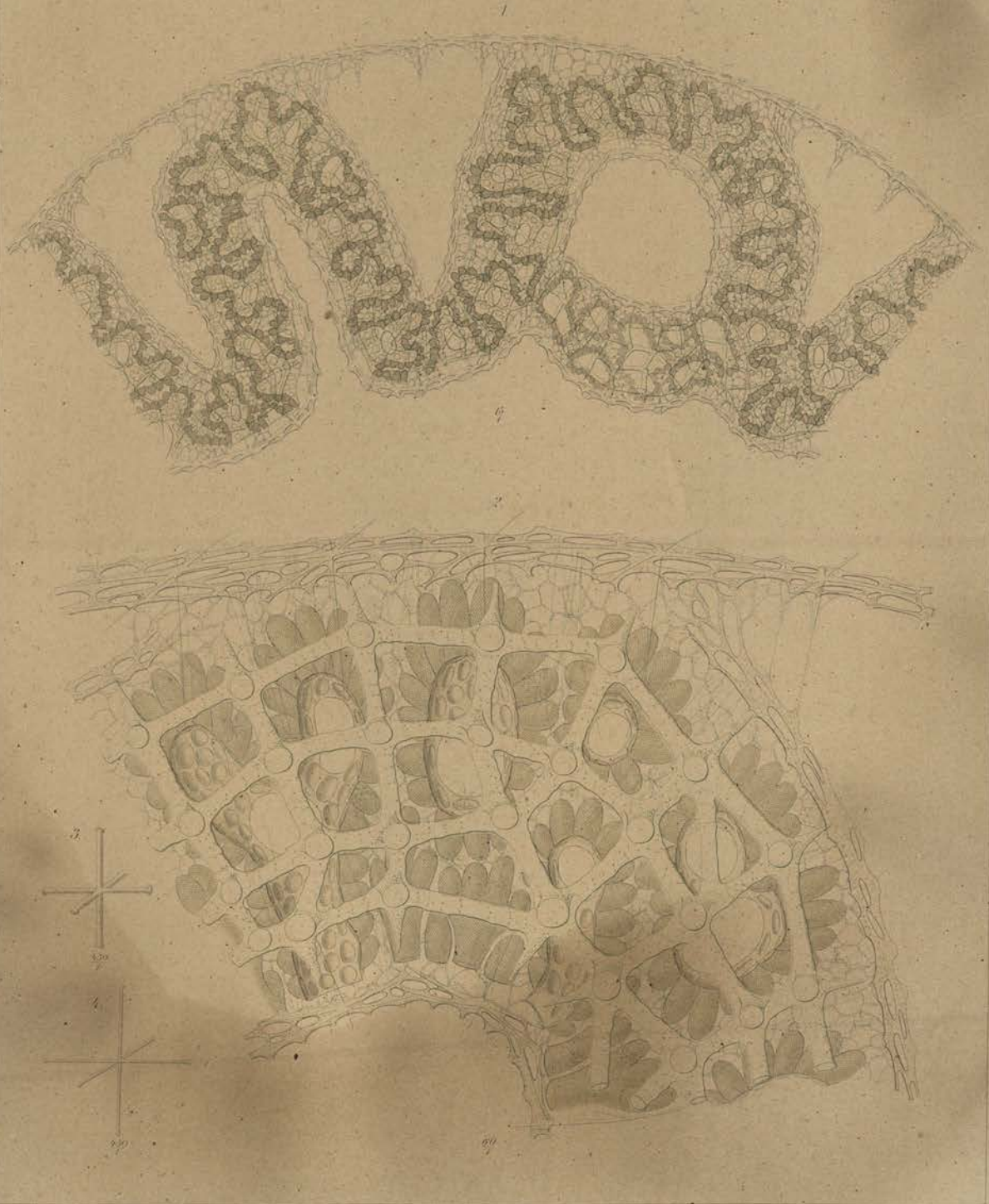
Hexactinella lata, F. E. S., ... 329

Fig. 1. Transverse section of the tube wall ; × 15.

Fig. 2. Transverse section of the wall of a canal ; × 60.

Figs. 3, 4. Sphærohexacts with straight smooth rays ; × 450.

For "*Tretodictyum latum*" on the Plate read "*Hexactinella lata*"; see note on Pl. XCIII.



TRETODICTYUM LATUM. F.E.Schulze.

PLATE XCVI.

PLATE XCVI.

PAGE

Hexactinella ventilabrum, Carter, . . . 331

Fig. 1. Lateral view of a dry specimen, from a photograph ; natural size.

Fig. 2. Superior view, from a photograph ; × 0·5.

Fig. 3. Vertical section of the exterior part of the skeleton with the loose spicules in their natural position ; × 50.

Fig. 4. Discohexaster with short principal and S-shaped terminal rays ; × 300

Fig. 5. Discohexaster with long principal rays ; × 300.

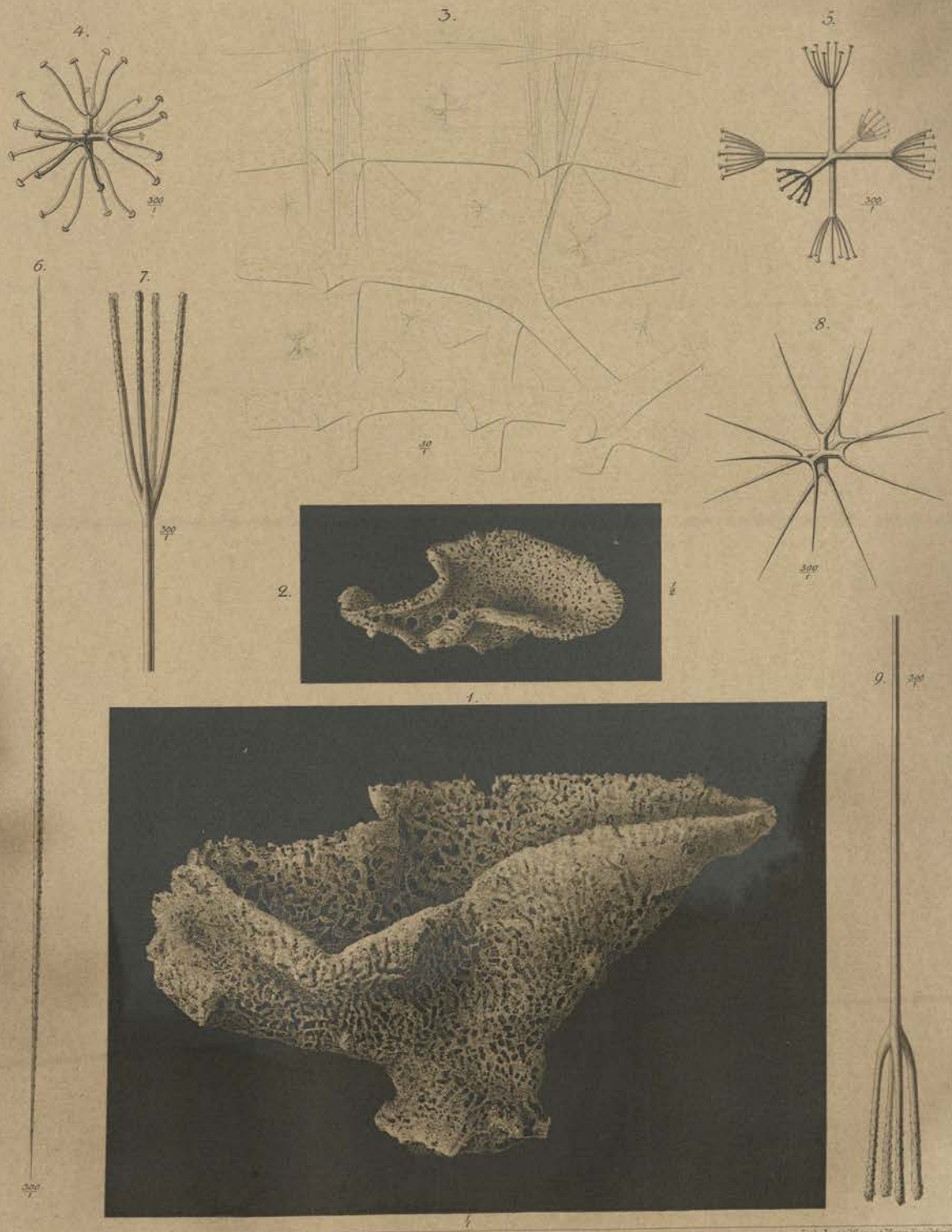
Fig. 6. Rough oxydiact corresponding to an uncinatum ; × 300.

Fig. 7. Exterior part of a dermal scopula ; × 300.

Fig. 8. Oxyhexaster with long straight terminal rays ; × 300.

Fig. 9. Part of a gastral scopula ; × 300.

For "*Tretodictyum cyathus*," F. E. Schulze, on the Plate, read "*Hexactinella ventilabrum*," Carter.



F.E. Schulze and G. Fritsch. del.

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TRETODICTYUM CYATHUS. F.E. Schulze.

PLATE XCVII.

PLATE XCVII.

PAGE

Fieldingia lagettoides, Saville Kent, ... 335

Fig. 1. A dried specimen, somewhat damaged, having lost the greatest part of the lamellar rind, from a photograph; natural size.

Fig. 2. A spherical knot of the skeleton, with some beams of the dictyonal framework; × 100.

Fig. 3. Star-like oxyhexaster with very reduced principal rays; × 450.

Fig. 4. Discohexaster with short principal and long terminal rays; × 450.

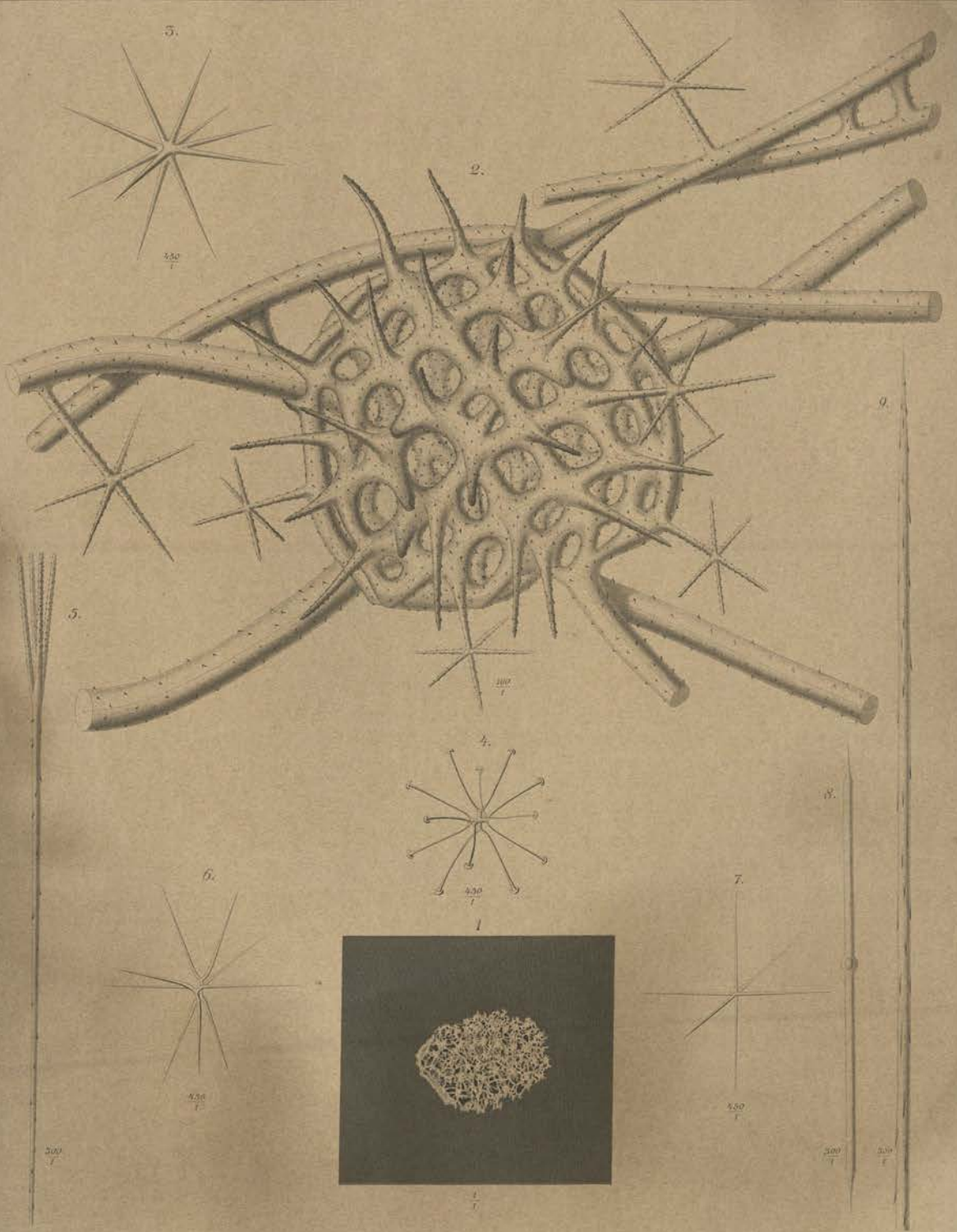
Fig. 5. Dermal scopula; × 300.

Fig. 6. Oxyhexaster with short principal and long terminal rays; × 450

Fig. 7. Simple oxyhexact with slender smooth rays; × 450.

Fig. 8. Smooth oxydiact with four central cruciately disposed knobs and pointed ends; × 300.

Fig. 9. Part of an uncinatum; × 300.



R. E. Schulze and G. Fritsch, del.

Lith. Anst. v. Werner & Winter, Frankfurt a/M.

FIELDINGIA LAGETTOIDES. Saville Kent.

PLATE XCVIII.

PLATE XCVIII.

Sclerothamnus clausii, W. Marshall. PAGE 337

Fig. 1. Copy of Dr. Jas. Murie's figure of a dried specimen ; × 0·25.

Fig. 2. Copy of Murie's figure of a branch of the stock ; × 0·5.

Fig. 3. Longitudinal section of a branch ; × 0·5.

Fig. 4. Copy of Murie's figure of the surface ; natural size

Fig. 5. Vertical section of the outer part of the skeleton, with the loose spicules in natural position ; × 50.

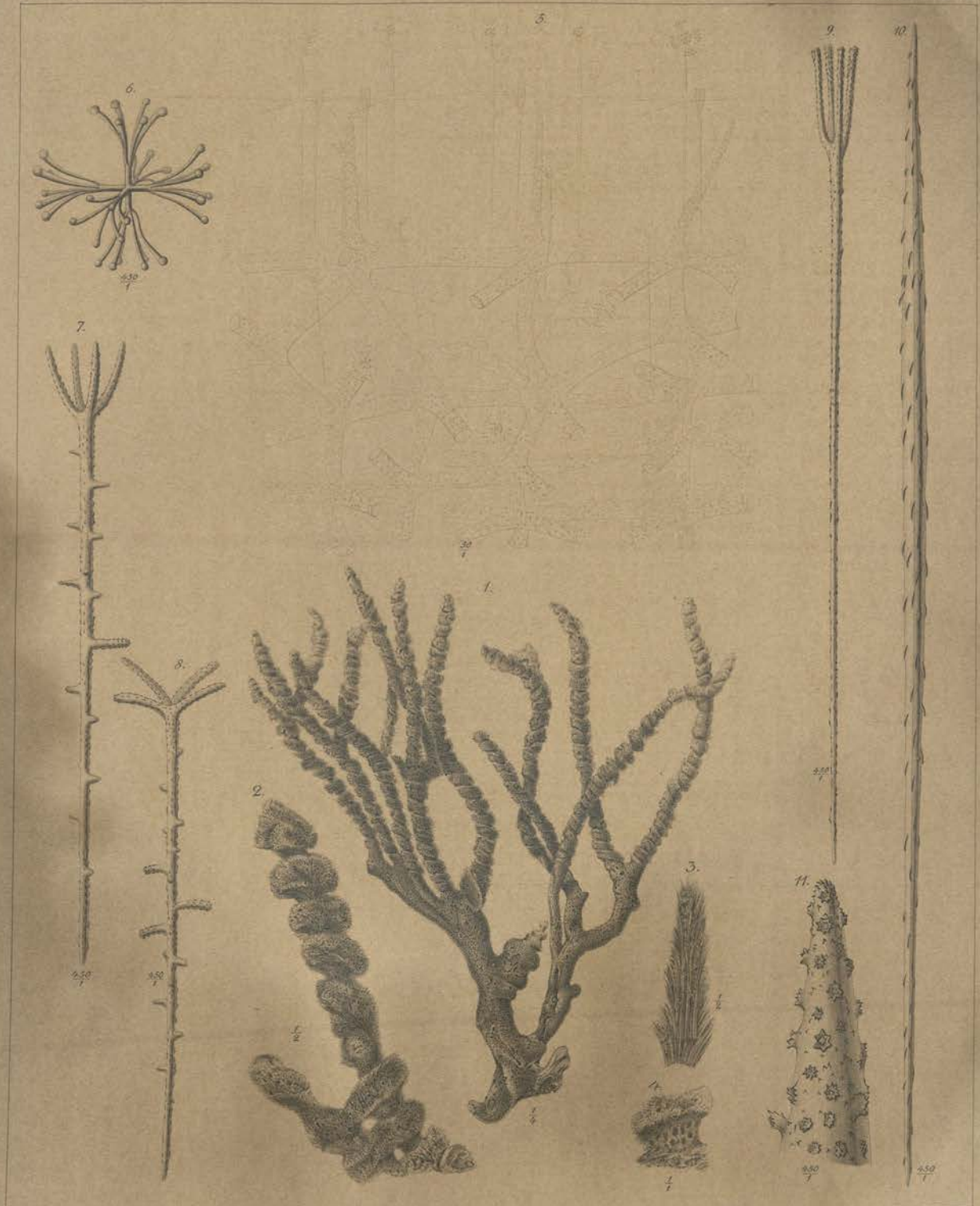
Fig. 6. Sphærohexaster with outwardly bent terminal rays ; × 450.

Figs. 7. 8. Parenchymal scopula-like spicules with knotted stalk and very divergent prongs ; × 450.

Fig. 9. Dermal scopula ; × 450.

Fig. 10. Uncinatum ; × 450.

Fig. 11. Free conical prominence of the dictyonal framework beset with broad low toothed prongs ; × 450.



F. E. Schulze and G. Ferrari del.

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SCLEROTHAMNUS CLAUSII. W. Marshall

PLATE XCIX.

PLATE XCIX.

PAGE

Dactylocalyx subglobosus, Gray, . . . 349

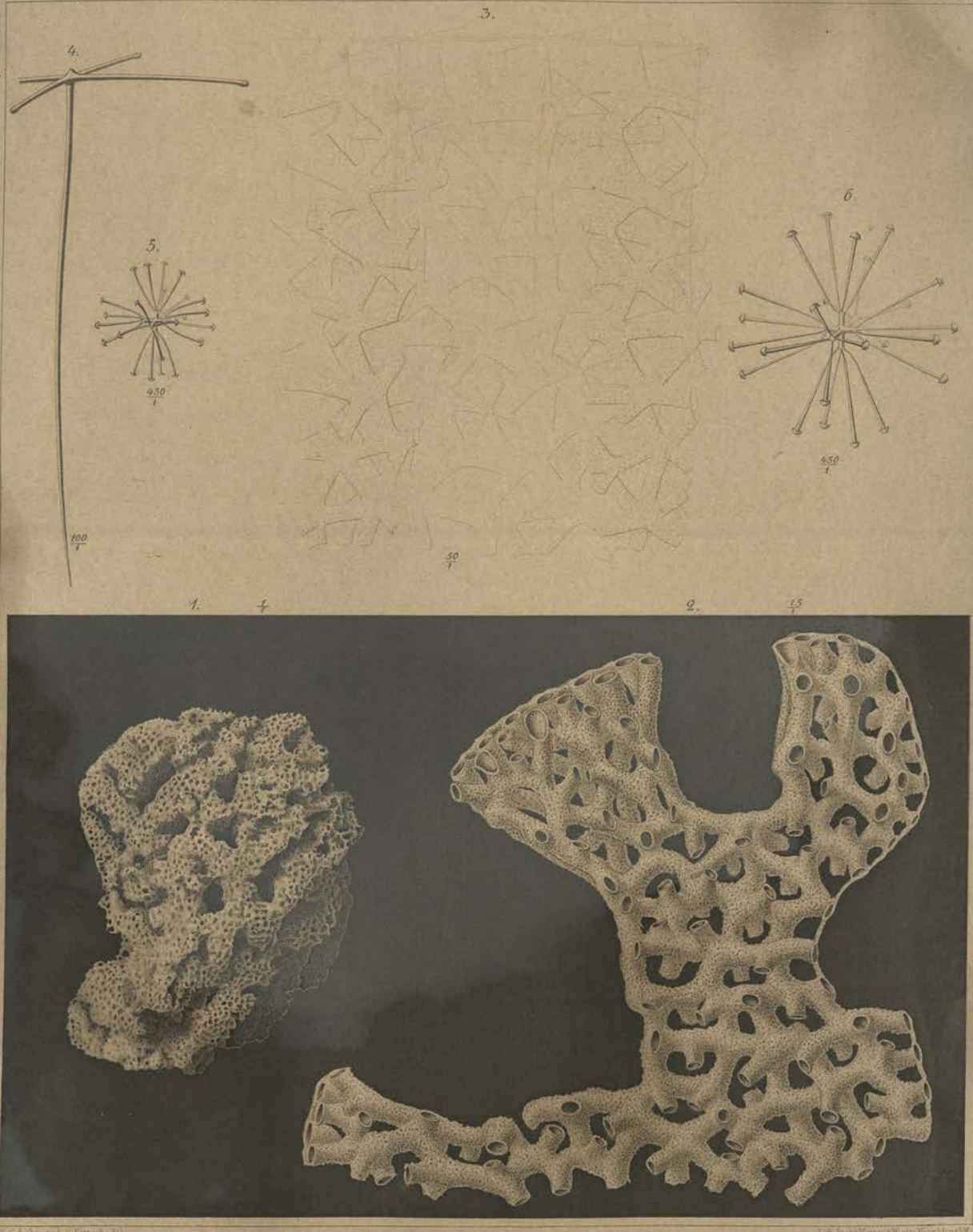
Fig. 1. A dried specimen; natural size.

Fig. 2. Diagrammatic representation, illustrating my conception of the structure of the framework of narrow tubes, showing a vertical section through the marginal part of the cup-shaped body; × 15.

Fig. 3. Vertical section of the exterior part of the skeleton, with the loose spicules in natural position; × 50.

Fig. 4. Dermal pentact with knobbed tangential rays; × 100.

Figs. 5, 6. Discohexasters with long terminal rays; × 450.



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DACTYLOCALYX SUBGLOBOSUS. J.E. Gray.

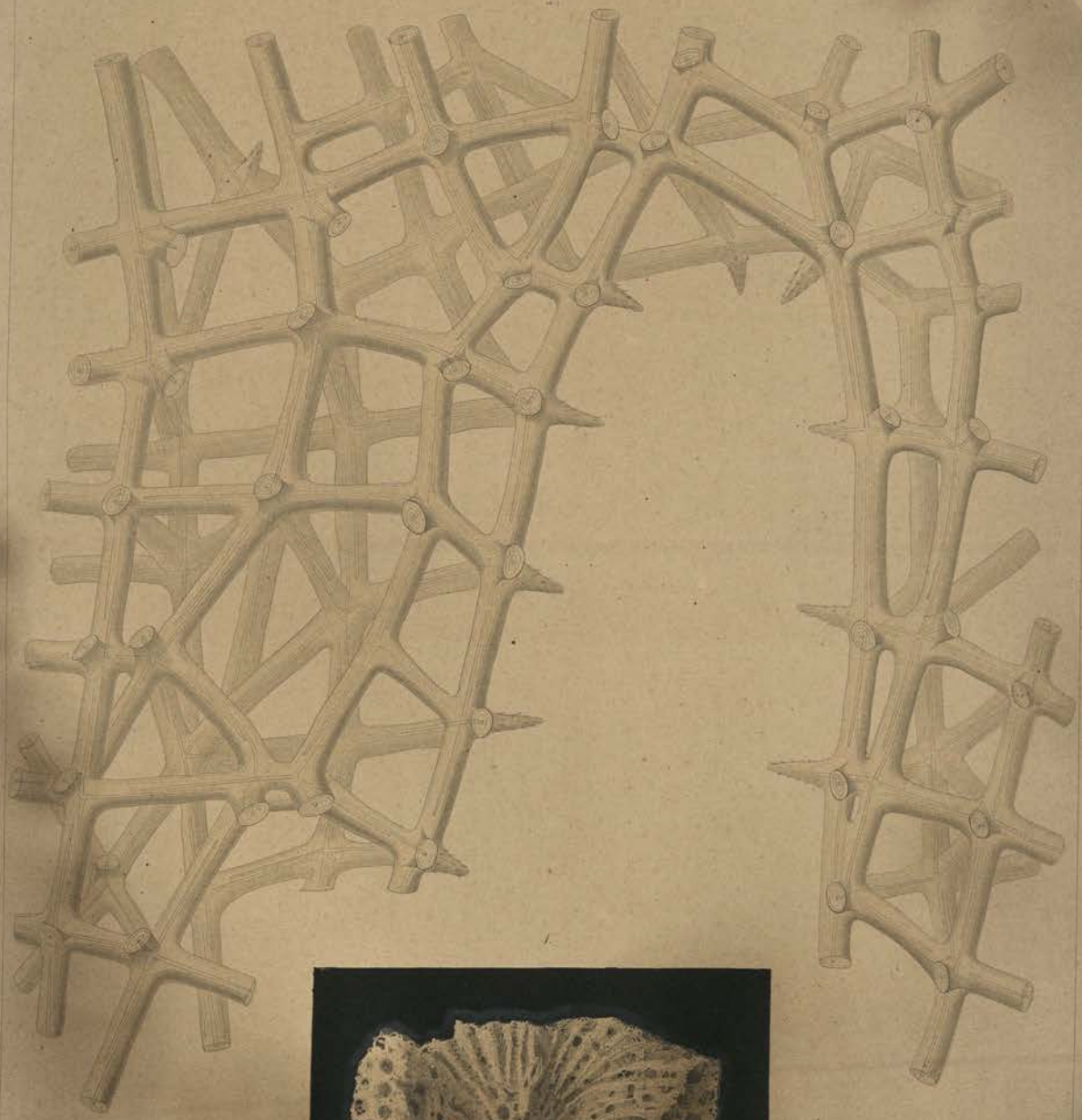
PLATE C.

PAGE

Dactylocalyx (?) *patella*, F. E. S., ... 350

Fig. 1. Fragment of the macerated skeleton; natural size.

Fig. 2. A portion of the macerated dictyonal framework; × 100.



DACTYLOCALYX PATELLA. F.E.Schulze.

PLATE CI.

PLATE CI.

PAGE

Figs. 1, 2. *Scleroplegma conicum*, O. Schmidt, . . . 351

Fig. 1. Inner view of a half of a macerated and longitudinally bisected specimen, from a photograph; natural size.

Fig. 2. Portion of the macerated dictyonal framework; × 100.

Figs. 3–8. *Margaritella cœloptychioides*, F. E. S., . . 351

Fig. 3. Vertical section of the outer part of the skeleton, with the loose spicules in their natural position; × 50.

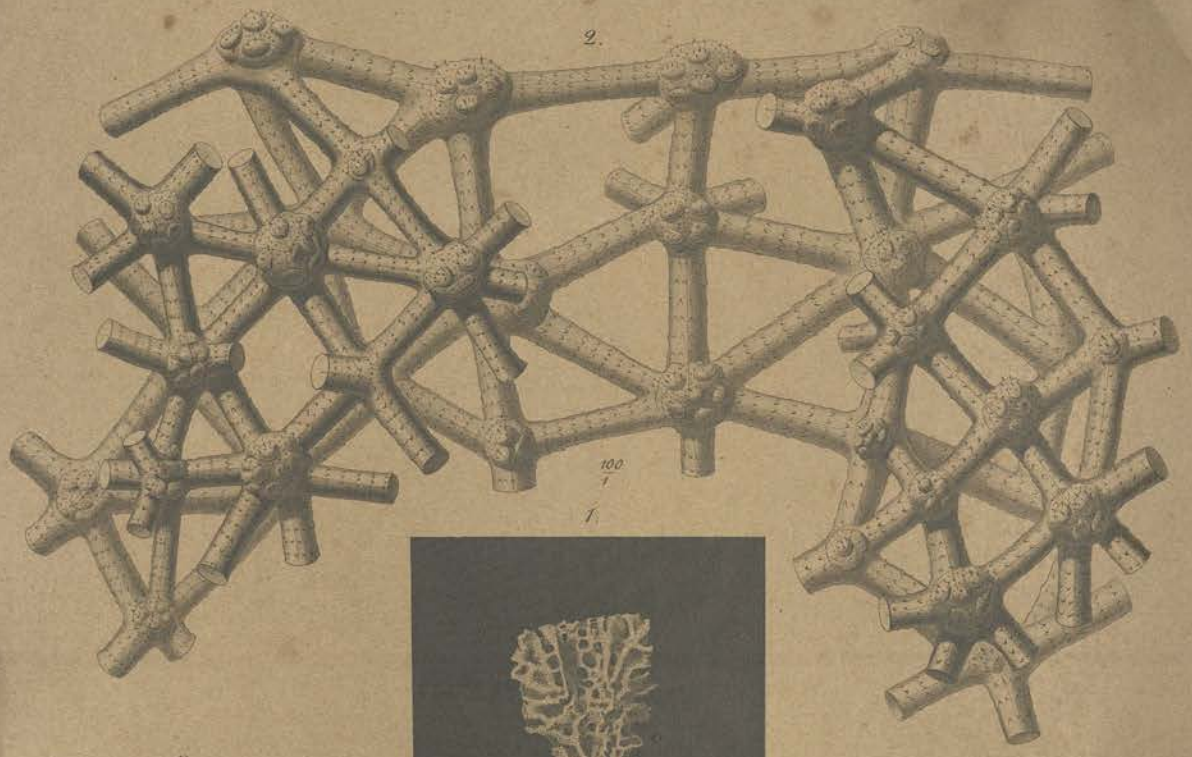
Fig. 4. Dermal pentact with nodulate rays; × 100.

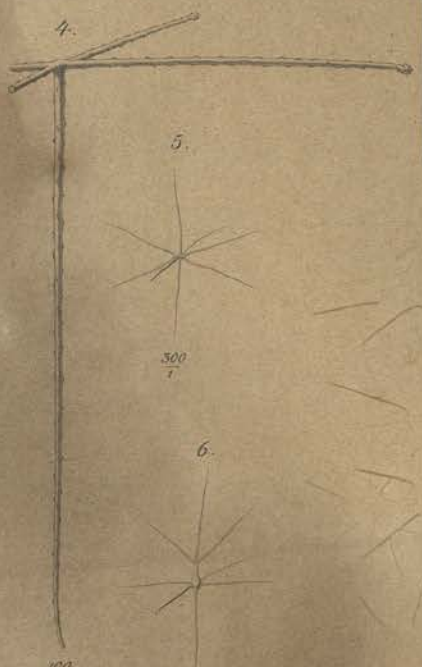
Fig. 5. Star-like oxyhexaster with very short principal and long undulating terminal rays; × 300.

Fig. 6. Oxyhexaster with long terminal rays; × 300.

Fig. 7. Star-like sphærohexaster with a solid spherical centre covering the very short principal rays; × 300.

Fig. 8. Small sphærohexaster; × 300.





F. E. Schulze and G. Hinde del.

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Fig. 1 & 2. SCLEROPLEGMA CONICUM. O. Schmidt. Fig. 3-8. MARGARITELLA COELOPTYCHOIDES. O. Schmidt.

PLATE CII.

PLATE CII.

PAGE

Euryplegma auriculare, F. E. S., ... 176

Fig. 1. A specimen, preserved in alcohol, restored ; natural size.

Fig. 2. Inferior fragment of a macerated specimen, from a photograph ; natural size.

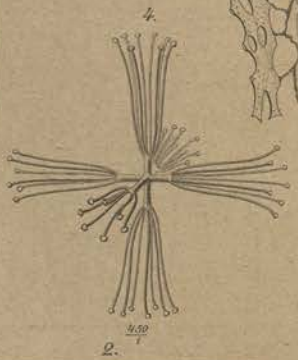
Fig. 3. Vertical section of the exterior part of the body ; × 50.

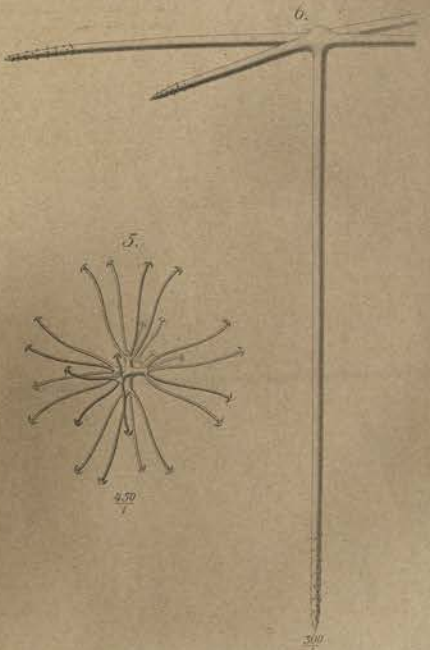
Fig. 4. Discohexaster with long terminal rays in perianth-like arrangement ; × 450.

Fig. 5. Discohexaster with S shaped terminal rays ; × 450.

Fig. 6. Dermal pentact with the ends of the rays rough ; × 300.

For "*auricularis*" on the Plate read "*auriculare*."





F.E. Schulze and C. Fritsch del.

Lith. Anst. v. Werner & Winter, Frankfurt a/M.

EURYPLEGMA AURICULARIS. F.E.Schulze

PLATE CIII.

PLATE CIII.

PAGE

Myliusia callocyathus, Gray, ... 354

Fig. 1. A specimen with two oscula, preserved in alcohol; natural size.

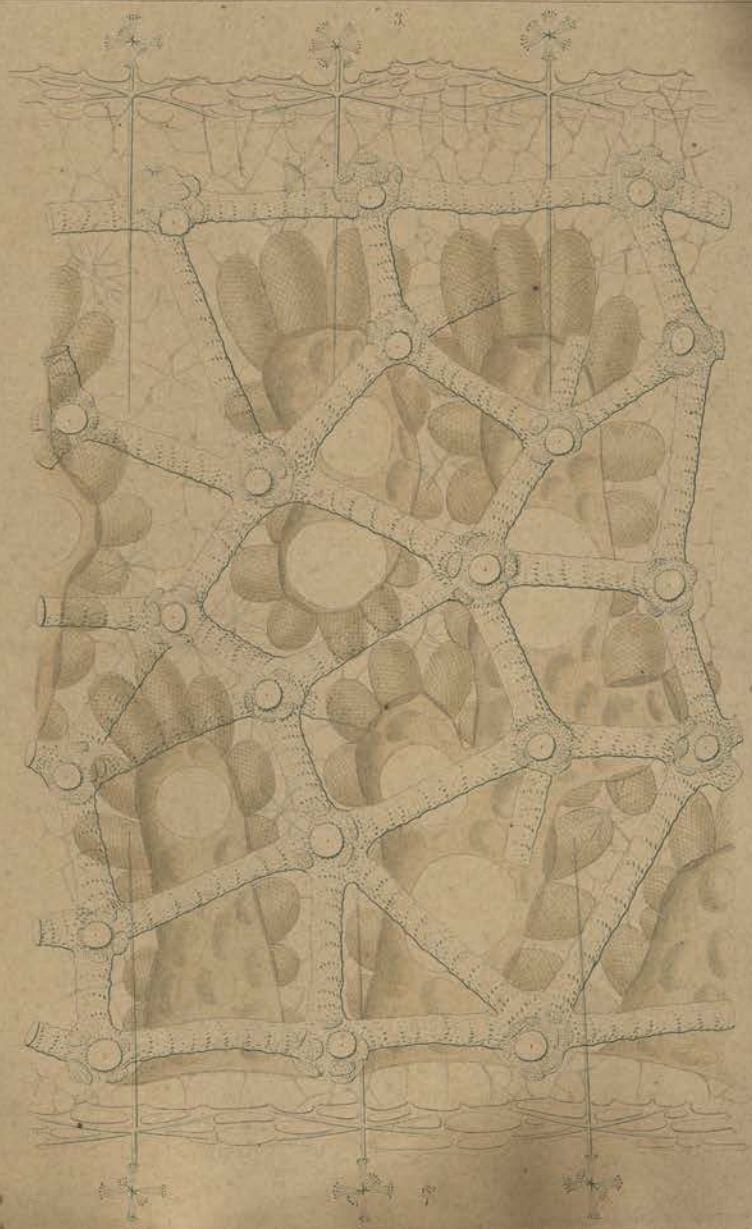
Fig. 2. Inner view of half of a longitudinally bisected specimen; natural size.

Fig. 3. Transverse section of the tube-wall (combination figure); × 60.

Fig. 4. Oxyhexact; × 300.

Figs. 5, 6. Oxyhexasters with S-shaped terminal rays; × 300.

Figs. 7, 8, 9. Discohexasters with S-shaped terminal rays; × 300.



MYLIUSIA CALLOCYATHUS. J.E.Gray

PLATE CIV.

PLATE CIV.

PAGE

Figs. 1–6. *Aulocystis zittelii*, W. Marshall, . . . 361

Fig. 1. A somewhat damaged specimen, preserved in alcohol; natural size.

Fig. 2. Macerated specimen with two oscular apertures; natural size.

Fig. 3. Transverse section of a tube-wall (combination figure); × 60.

Fig. 4. Graphiohexaster with somewhat undulating terminal rays; × 300.

Fig. 5. Discohexaster with short principal rays; × 300.

Fig. 6. Discohexaster with long principal rays; × 300.

Fig. 7. *Aulocystis grayi*, Bowerbank, ... 359

Fig. 7. Discohexaster with short principal and numerous long terminal rays; × 300.

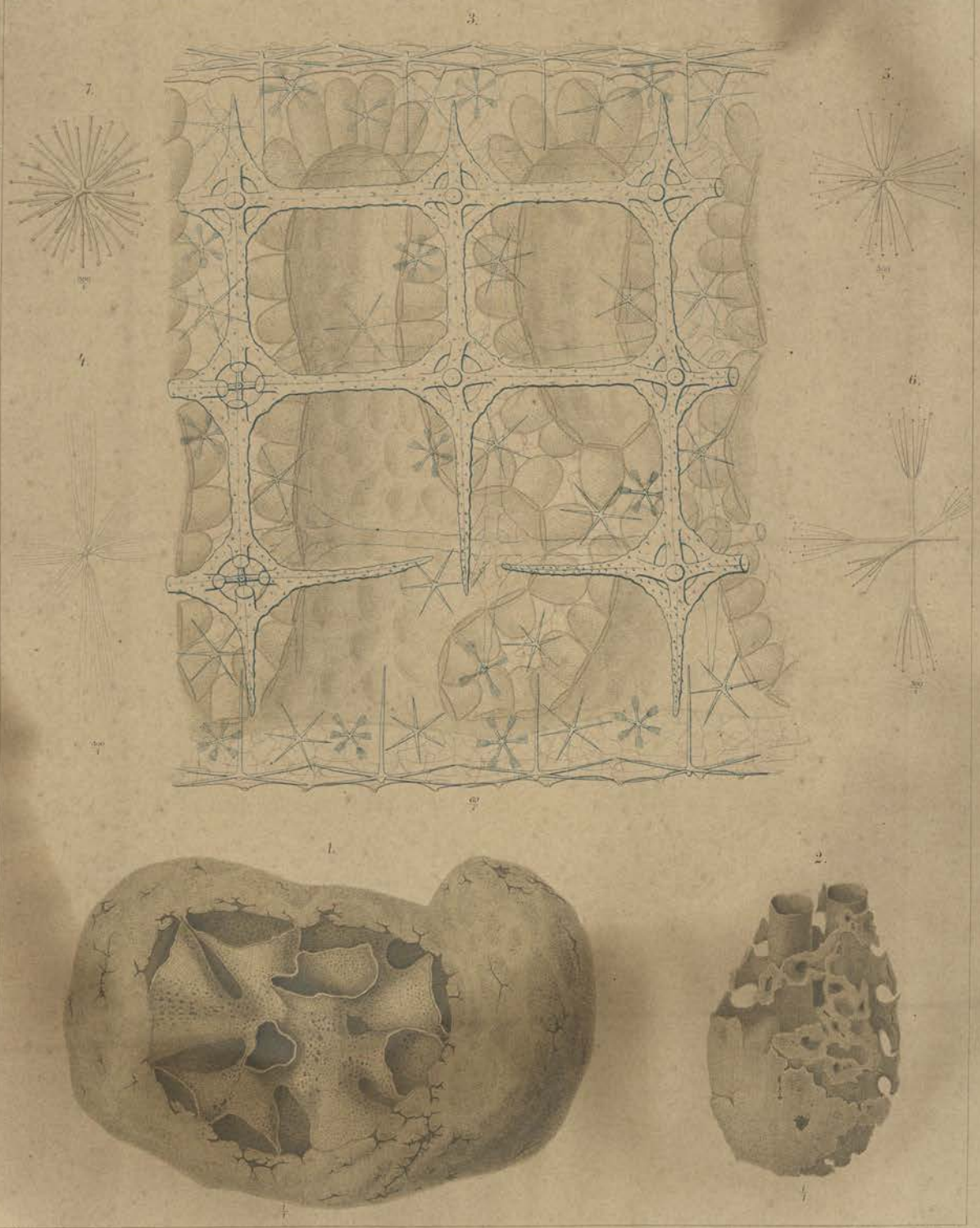


Fig. 1–6. AULOCYSTIS ZITTELII. W. Marshall. Fig. 7. AULOCYSTIS GRAYI. J.S. Bowerbank.

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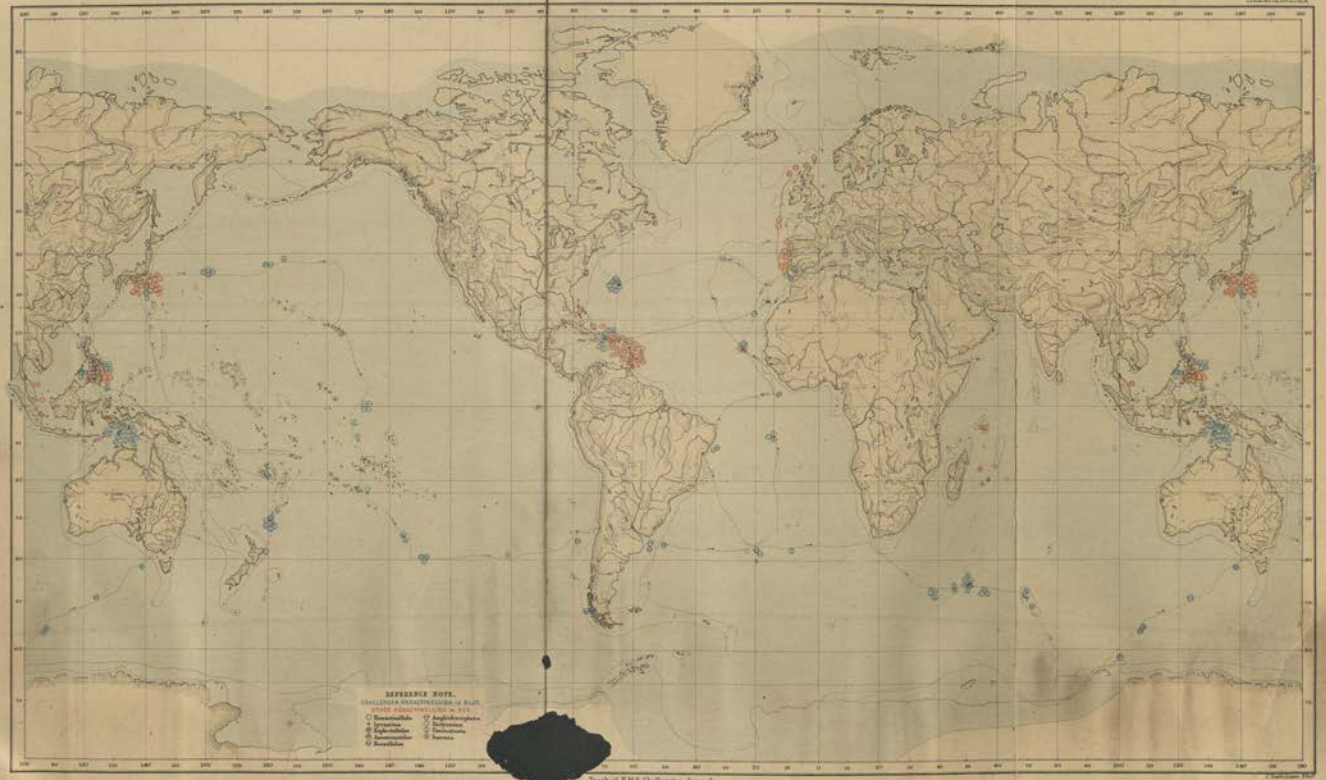

Track of H.M.S. Challenger shown thus

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